THE VALUE OF AN ASSOCIATE IN ARTS DEGREE TO COMMUNITY COLLEGE GRADUATES WHO DO NOT TRANSFER TO THE UNIVERSITY

By

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In the 1980-1981 academic year, five community colleges graduated 2810 students with Associate in Arts degrees. During the next eight years these graduates pursued a variety of employment and academic paths. The purpose of this study was to examine the value of the Associate in Arts degree eight years following graduation. The value of the degree was determined within the framework of the Weisbrod's suggested direct private and social benefits resulting from additional education. The graduates were subdivided into three cohorts based on the academic path followed after graduation. FATE #1 consisted of graduates who did not transfer into a state university or did not complete over 12 credit hours of university credit, FATE #2 included only those graduates who transferred to the university, completed more than 12 credit hours but did not graduate, and FATE #3 contained those graduates who

transferred to a university and completed a baccalaureate degree.

Graduates in FATE #1 compared favorably with graduates in FATE #3 in several ways. A differential rate of return comparing FATE #1 and FATE #3 indicated a higher rate of return for graduates in FATE #1. In five of eight Standard Industrial Classification (SIC) divisions there were no significant differences between the mean annual earnings or the total number of weeks employed for all three FATEs. With the exception of the Retail SIC division, there were no significant differences in the financial opportunity options offered within the current job market. Finally, employers indicated a marked preference for an Associate in Arts degree graduate over a high school graduate with similar experience. These employers offered a wide variety of potential educational opportunities for Associate in Arts degree graduates. The principal differences observed between FATE #1 and FATE #3 occurred within SIC divisions in which a baccalaureate degree was a requirement for specific positions. In the Retail and General Services SIC divisions, graduates in FATE #3 had a significantly greater mean annual earnings than individuals in FATE #1 or FATE #2. However, in the Public Administration division, experience had a greater influence on employment decisions than education and the mean annual earnings of FATE #1 were significantly greater than FATE #3.

CHAPTER I
THE PROBLEM AND ITS SIGNIFICANCE

Introduction

Community college advocates have traditionally considered the primary mission of a community college to be a three-fold commitment to the district it serves (Witt, 1988). The first component of the mission is to insure that an academic program exists which allows students to transfer successfully to an upper-division institution as a junior. The second component of the mission is the delivery of an array of occupational programs which provide students access to the technical careers that exist within the communities that compose the institution's district. The final component of the mission is to provide a comprehensive set of community service courses which, although not providing college credit, offer an opportunity for life-long learning to the adults of the district. In addition, there has been recently an increased emphasis upon meeting the educational needs of local business and industry leaders.

In recent years legislator and voter interest groups have focused on determining the success of the community college within the context of its stated mission. Accountability in an educational environment usually 1 requires that evidence be presented that demonstrates that

community colleges are fulfilling all three components of their stated mission. Longitudinal studies of community college graduates' transfer success have historically been used as a yardstick to determine if the community college is indeed fulfilling the transfer function. Both community college critics (Bernstein, 1986; Zwerling, 1986) and community college supporters (Vaughan & Templin, 1987) have pointed to the declining numbers of entering students who ultimately transfer to baccalaureate programs as prima facie evidence of a declining emphasis upon the transfer component of the community college mission.

Estimates of the number of community college students transferring range from 3% to over 71% (California Community Colleges, 1984) depending on which definition the researcher uses to define the pool of potential transfer students. In addition, these estimates vary dramatically due to differences in the analytical techniques employed or the number of years being considered when counting the students who transfer to upper-division institutions. Independent of the methodology or time frame used, it is evident that there is a large population of students who have not been included when determining the effectiveness of community colleges. What is happening to the 30-60% of the Associate in Arts degree graduates who are not transferring to the university? Surprisingly, this population of community college students who graduate with an Associate in Arts degree and, for whatever reasons, do not transfer to a four-year institution

to pursue their baccalaureate degree have been almost completely ignored in most follow-up studies. What has happened to these students after they graduate? Does an Associate in Arts degree, representing 60 to 64 credit hours of general education courses, serve as a credential which gives the graduate an advantage over nondegree holders in the work place? Does an individual with an Associate in Arts degree have a greater potential for employment in the local employment market than a high school graduate? Does the employer perceive that an employee with an Associate in Arts degree is an asset to the organization? If the full mission of the community college is to be assessed accurately, it is essential that all Associate in Arts degree graduates are considered when determining the success of the community college in providing educational opportunities to the populace of its district.

Education as an Investment

"By investing in themselves, people can enlarge the range of choices available to them. It is one way free men can enhance their welfare" (Schultz, 1968 p. 14). Students who enter any of the vocational programs available in a typical community college are clearly making a direct investment in their own future by expending time, money, and energy pursuing specific training for future careers. Not only are they securing training, but they are also gaining the prerequisite credentials to be recognized as having met

the minimum requirements for an entry-level position in a technical career field.

Students who have elected to pursue a baccalaureate degree are also investing in their future because a baccalaureate degree typically leads to higher earnings and a greater array of potential employment opportunities. U.S. Bureau of the Census (1984) data reveal that the mean annual earnings for individuals with 16 or more years of schooling consistently was $3000-13000 higher than high school graduates and $2500-8500 more than individuals with 1-3 years of college. The U.S. Census Bureau collapsed the data for two-year college graduates with those students who do not complete either an Associate in Arts degree or a baccalaureate degree. The question that must be answered is whether the community college graduates with Associate in Arts degrees have also made an investment in their future by using their Associate in Arts degree as a credential in the job market. In other words, is there a demonstrable economic and social gain for an individual who chooses to terminate his or her investment in education with an Associate in Arts degree as opposed to those graduates who continue on to a university?

Human Capital Gain

In 1960 Schultz first introduced the concept of "human capital" in an address he presented at a meeting of the American Economic Association (Alexander, 1986). Human capital is the human component of a nation's resources which

act as "catalytic agents in producing physical capital, building social, economic and political organizations, and promoting natural development" (Alexander, 1986, p. 192). The idea of human capital gain was so fundamental to the measurement of the value of an education as viewed by Alexander that he envisioned the educational process as making a direct investment in human capital. "Investing in people makes it possible to create and adapt to technological progress. Health and formal education constitute the two major ways investment in human capital can be made" (p. 192). Goffman, Davis and Morall (1972) went even further and stated

> An investment in education, in health or in moving to a new area is just as much an investment as a new factory or public bridge. An initial expenditure is undertaken with the hope of generating a higher return of net income in the future. (p. 2)

In addition, Goffman et al. (1972) went on to state that

> an investment is <u>anything</u> which accumulates capital. . . . capital is a stock of assets that yields a stream of income or utility over time; thus income is the product of capital. . . . The differences between investment in human capital, and investment in physical capital are mostly in degree, not in kind. Thus, one theoretical structure is useful in understanding all types of investment behavior (p. 4).

If education is an investment in human capital, and if human capital is essentially the same as physical capital, then it follows that a rate of return on investment can be calculated. Bowen (1968) asserted that there are four primary approaches to assessing the relationship between education and economic activity: (a) simple correlation,

(b) residual approach, (c) direct returns to education approach, and (d) forecasting manpower needs approach. Bowen described these analytical approaches as they apply to the relationships between nations or between business organizations. Of these four approaches only the simple correlation and the direct returns to education approaches are commonly used for assessing the human capital gain made by an individual's investment in his or her own education (Ashenfelter & Ham, 1979; Leslie & Brinkman, 1986; Nunley, 1986; Okachi, 1983; Psacharopoulos & Woodhall, 1985; Taubman, 1976; Taubman & Wales, 1973).

Hansen (1963) described a methodology for calculating the internal rate of return on an investment in education by comparing age-income profiles of different groups of individuals who have differing levels of education. From the differences between age-income profiles he was able to estimate a discount rate which was a correction factor that accounted for changes in the absolute value of a salary earned this year as compared to a salary earned in the future. The estimated discount rate was then used to establish the internal rate of return on an investment in education.

Goffman, Davis, and Morall (1972), writing for the Presidential Commission on School Finance, stated "the rate of return approach is the fundamental analytical tool of the economics of educational investment" (p. 3). Hansen's methodology has been used repeatedly for estimating the

economic returns to a nation or a group of individuals for an initial investment in education. Researchers who have estimated the rate of return on an investment in education have most frequently utilized census data for these comparisons (Becker, 1964; Carnoy & Marenbach, 1975; Freeman, 1977; Hanoch, 1967; Mincer, 1974; Raymond & Sesnowitz, 1975; Wachtel, 1975).

Statement of the Problem

The purpose of this study was to determine if the Associate in Arts degree has value as an investment to graduates who do not continue into baccalaureate degree programs. The value of the degree was estimated within the framework of the benefits derived from education as described by Weisbrod (1964). Weisbrod divided the benefits into direct and indirect benefits to the student and direct and indirect benefits to the greater society in which the student was a participant. The primary direct benefits to the student outlined were (a) a direct financial return in the form of income, (b) a financial option return in the form of an increased value for the opportunity to obtain further education, (c) increased opportunity options through a broadening of individual employment opportunities, and finally, (d) education acting as a hedge against job displacement due to technological change. The principle direct social benefits were outlined as (a) an increase in labor productivity, (b) an increased tax base and a lower need to incur costs, and (c) a general increase in social

welfare by development of a greater public-spiritedness or social consciousness.

The direct financial returns to the student were determined by estimating the internal rate of return on investments in education made by all Associate in Arts degree graduates within a subsample of the graduates. The direct financial returns were also examined by comparing the incomes received by groups of graduates disaggregated into Standard Industrial Classification (SIC) categories. The financial option returns that were examined were the availability of employer-sponsored educational programs designed to promote further education among employees that have only an Associate in Arts degree and also the potential benefits available to individuals who secure additional education. The opportunity option was assessed by examining the distribution of graduates within SIC categories to determine if differences in education and income could account for perturbations in hiring practices that would potentially cause the preferential distribution of Associate in Arts graduates within certain job categories. Finally, the perceptions of employers about the value of an Associate in Arts degree as a hedge against technological displacement of skills by extending a graduate's willingness and ability to learn new tasks was assessed though a direct interview process.

The direct social benefits were assessed by comparing the mean number of weeks employed in groups of graduates

with differing amounts of total formal education. This variable was a surrogate that would reflect differences between groups of graduates in the income available for taxation, labor force productivity, and also differences in costs to society for increased unemployment compensation.

Although it is impossible to ascertain every conceivable direct student and social benefit, a multifaceted approach to the total analysis was utilized to examine a number of interrelated benefits. The multilevel analysis was utilized to construct an intellectual and fiscal framework in which an individual with only an Associate in Arts degree could be reasonably compared to other individuals who followed alternate pathways following graduation with an Associate in Arts degree.

The direct benefits of an Associate in Arts degree to the graduate who did not continue their education was estimated by answering the following questions:

1. Does the private internal rate of return on an investment in education for an individual with only an Associate in Arts degree compare favorably to the rates of return for individuals who secure additional education?

2. Do Associate in Arts graduates who do not transfer to a university have available a different array of potential employment opportunities than graduates who pursue further education?

3. Do the annual incomes of Associate in Arts degree graduates who do not transfer to the university differ

significantly from the annual incomes of Associate in Arts degree graduates who pursue further education when the graduates are employed in the same general industrial classification category.

4. Do the employers of nontransferring Associate in Arts degree graduates perceive that the experiences or skills gained as a result of additional education serve as a hedge against technological change by enhancing the individual's productivity or an employee's willingness or ability to learn new skills.

5. Do nontransferring Associate in Arts degree graduates experience significantly less time unemployed than Associate in Arts degree graduates who secure a baccalaureate degree?

Assumptions

A fundamental assumption upon which the entire area of human capital gain and the study of the benefits of education is predicated is the assumption that education and income are related in some meaningful way. Several lines of thought emerge when this relationship between education and income is examined. Quattrociocchi (1980) summarized several basic hypothetical mechanisms by which education and income are related:

1. Education is merely reinforcement for something that comes earlier, i.e., individual ability, family background, personal goals.
2. Education increases individual productivity because of various cognitive and affective skills produced.

3. Education does not necessarily increase individual productivity, but confers a "credential." Employers exclude non-credentialed employees from high paying jobs. (p. 27)

This study was focused on primarily numbers 2 and 3 of Quattrociocchi's suggested mechanisms.

Delimitations

In examining the rate of return approach to the analysis of human capital gain, Bowen (1968) pointed out that "groups with differing amounts of education tend to differ systematically in terms of other attributes which are also likely to influence relative earnings" (pp. 79-80). Bowen pinpointed the primary difficulty arising from any attempt to analyze the increase in the value of human capital within an individual or a recognized population. The problem is that a wide variety of extraneous factors potentially could confound the analysis. These factors include innate ability, motivation for self-defined success, pressures from external monetary demands, experience in the work place, and simply interpersonal relationships between supervisor and employee. These factors and a myriad of others may interfere with an absolutely accurate assessment of the magnitude of the relationship between an increase in the value of an individual's human capital and an increase in annual income. It is, however, possible to examine the relative value of accrued human capital between segments of a population when all members are potentially influenced by similar set labor market forces. It is therefore incumbent

on the researcher to control as many of the extrinsic factors as is necessary and to define carefully the characteristics of the population under study. These characteristics must be utilized to establish population parameters which should be used as the most conservative limitations on the external validity of the study.

The limits of the applicability of this investigation are, most strictly, the community college graduates within the state being studied who graduated in the 1980-1981 academic year. Its applicability to populations of students not graduating from the participating institutions or those having graduated in other years is much more tenuous. It is within the confines of these delimitations that this study was undertaken.

Justification for the Study

Because the community college mission has traditionally focused on students who pursue transfer programs, vocational programs, or adult/community education courses, any assessment of community college effectiveness would by necessity concentrate on the purposes addressed within the mission of the institution. The success of Associate in Science and certificate-granting vocational programs is readily assessed by examining how many students are working in the fields in which they were trained. Associate in Arts transfer programs have been traditionally assessed by examining how many students complete their baccalaureate degrees (Delaino, 1987; Florida State Department of

Education, 1983). Delaino (personal communication, November 12, 1987) found that approximately 40% of all the Associate in Arts degree graduates from Florida community colleges do not transfer to a university within Florida.

It is evident from the data available that a large proportion of Associate in Arts degree graduates are not transferring to a university. If these graduates are not transferring, a large percentage of them must be entering the workforce.

This study was designed to expand the understanding of the practical value of an Associate in Arts degree and to examine the relative and perceived value of the Associate in Arts degree to the employer who hires the graduate who "transfers" from the community college to a 40 hour per week job.

Overview of the Methodology

The Sample

In an attempt to represent the diversity of the graduates of community colleges throughout the state, the total 1980-81 graduating classes of five preselected community colleges was used as the initial sample for this study. The initial sample included 2810 individual social security numbers. Each participating college identified all individuals who graduated during the 1980-81 academic year. These students were matched by social security number with the State University System (SUS) Student Data Course File that was available through the Interinstitutitonal Research

Council (IRC). The Associate in Arts degree graduates' social security numbers were matched with the SUS data tapes for each semester since their community college graduation up through fall semester 1987.

The community college graduates were divided into subsamples based on three realistic alternate outcomes. Each of the three potential outcomes were referred to as FATE #1, FATE #2, and FATE #3. FATE #1 was composed of those graduates who did not register at a state university or who did register but did not make significant progress towards a baccalaureate degree. Significant progress in this setting is defined as having successfully completed more than 12 credit hours in seven years. FATE #2 consisted of Associate in Arts graduates who transferred and enrolled for 13 or more credit hours at one of the state universities but did not graduate as of fall semester 1987. The final subsample, FATE #3, was composed of Associate in Arts graduates who transferred and completed their baccalaureate degrees prior to fall semester 1987 or were identified as postbaccalaureate students within the SUS Student Data Course File.

Despite the initial division of the graduates into three subsamples, the primary focus of the study was the Associate in Arts graduates who have made little progress towards further formal education (FATE #1). This subsample has been virtually ignored by researchers; however, they osed about one-third of the Associate in Arts degree

graduates during the 1980-81 academic year. The other two subsamples were used primarily for comparison.

Within the total sample of graduates, there were undoubtedly an admixture of postgraduation experiences. Some of the graduates could have transferred to schools which are not part of the SUS, others could have become homemakers and thereby removed themselves from the job market, and some could have moved out of the state and thus out of the range of the available data bases. Because the graduates could have taken a variety of paths since graduation, it was essential to narrow further the scope of the sample to be studied.

With the cooperation of the Occupational Identifier Project (OIP), a special experimental program within the Florida State Department of Education, it was possible to gain access to the Department of Labor Statistics Unemployment Compensation Insurance data base. The Department of Labor Statistics Unemployment Compensation Insurance data base contains five quarters of employer-reported demographic and economic data on all employed individuals living in the state that are covered by Unemployment Compensation Insurance. This includes over 95% of all workers within the state.

By cross-matching the social security number of each graduate with the Department of Labor Statistics Unemployment Compensation Insurance data base it was possible to identify those graduates who have been employed

within the state for any one of five quarters (Quarters 1-4, 1987 and Quarter 1 of 1988). Specific economic data such as quarterly income, weeks of employment, number of jobs held and SIC code for each job were extracted from the Department of Labor Statistics data base and appended to the data set extracted from the SUS Student Data Course File. The final result of the consolidation of the data sets were three data sets, each consisting of information on individual graduates who were employed within the state during any of the five quarters collected. In addition to the graduate data, information was also available for each individual graduate's employer(s). The employer data included company name, address, phone number, and contact person. The graduates' data which were extracted included name, social security number, demographic, SIC, and income data.

A random sample of approximately 200 graduates from each FATE was then selected for further analysis. In addition, a second subsample equal to 5% of the individuals in FATE #1 or approximately 33 individuals were randomly chosen as the subjects for the individual interviews.

The Employer Interview

Because the principle focus of the research was the nontransferring Associate in Arts graduate, the final sample of 5% of the graduates in FATE #1 was the subject of further investigation via in-depth telephone interviews that were conducted with each graduate's employer. These interviews were used in order to determine what the employers perceived

to be the characteristics or skills that employees with an Associate in Arts degree brought into the work environment and also how an Associate in Arts degree is utilized in hiring, training, and promotion decisions. The interviews consisted of a series of questions which were identical for each employer.

All employers identified within the 5% subsample were interviewed by phone to assess

1. What was the number of employees with Associate in Arts degrees?

2. What were the type(s) of encouragement given to employees who were pursuing additional education?

3. Was there a salary structure or hiring policy exist which specifically includes an Associate in Arts degree?

4. Is preferential consideration given to new employees with Associate in Arts degree as compared to high school graduates?

5. Do they perceive that Associate in Arts degree graduates bring specific skills or abilities into the work place?

The Pilot Study

Prior to the initiation of the interview process on the FATE #1 subsample, a pilot study was used to refine the interview instrument and to highlight potential problems with the process. The pilot study sample consisted of a group of 25 graduates from one of the participating community colleges. These graduates, however, graduated a year later than the sample in the primary study. The pilot group's social security numbers were appended to the data set from 1980-81. When the data set was returned from the

OIP, the pilot sample consisted of all the individuals identified as being in FATE #1 or a sample consisting of six individuals. The results of the pilot study were not included in the actual study; however, the data were used as a guide for modifications in the interview process.

Analysis of the Data

The key to the analysis of the data is actually the working definition utilized to define functionally "human capital gain." The traditional tool used to measure the economic returns of an investment in human capital is the internal rate of return on the investment in education made by the student.

> To estimate the internal rates of return to investments in schooling we require data on costs -total resource costs and private resource costs- for various levels of schooling as well as data on age-income patterns by each level of schooling. From these, life cycle cost-income streams can be established that show for each level of schooling the flow of costs incurred during schooling and the subsequent flows of additional income that can be attributed to that schooling. The internal rate of return is then estimated by finding that rate of discount that equates the present value of the cost outlays with the present value of additional income flow. (Hansen, 1967, p. 139)

For the purposes of this study, it was essential that the definition of "human capital gain" be expanded beyond simply a rate of return on the individual's investment or the annual income of the graduates. Education not only provides returns to the individual, but also it provides returns to the community as a whole. Weisbrod (1964) pointed out that there is a spillover effect of education which is not readily apparent nor measurable. This spillover is usually

manifested as the effect of increased education and income on not only the student but also the student's family, neighborhood, and local community. In order to evaluate the value of an Associate in Arts degree to a graduate in more global terms, the data gathered within this study was used to determine the relative value of an Associate in Arts degree by examining (a) the potential for the graduate to pursue further education or on-the-job training, (b) the value of the Associate in Arts degree in the context of the hiring process, (c) the perceived value of an Associate in Arts degree as a hedge against technological displacement of skills, and (d) a direct comparison of the number of weeks of unemployment which the graduates have experienced. The number of weeks of employment reflects a lower social burden because the more weeks an individual is productively employed, the lower the costs in terms of unemployment compensation or welfare.

Definition of Terms

The Associate in Arts (AA) degree is a two-year liberal arts degree granted after 60-64 credit hours of general education courses are completed. This degree is comparable to the freshman and sophomore years of a four-year college or university.

Human capital is a term used to describe the human component of a nation's resources which act as "catalytic agents in producing physical capital, building social,

economic and political organizations, and promoting natural development" (Alexander, 1986, p. 192).

Human capital gain describes all of the returns from investments (outlays or sacrifices) which are made to transform the mental or physical equipment embodied in individual persons in ways that enable them (a) to produce more or better goods or services, (b) to earn higher pecuniary incomes, (c) to spend their incomes more intelligently, or (d) to get more pleasure out of life as a result of enhanced awareness and appreciation of some "finer things" that appeal to more sensitized minds--"nonpecuniary satisfactions" (Malchlup, 1984, p. 420).

The Standard Industrial Classification (SIC) is a multidigit code used by the Department of Labor Statistics to identify a type of industry or business.

The Florida Interinstitutitonal Research Council is a consortium of cooperating community colleges which has as its primary purpose the investigation and distribution of information on research or projects of mutual concern.

Occupational Identifer Project is a State of Florida funded project under the auspices of the Department of Education. It is responsible for aiding educational follow-up studies of graduates of high school, community colleges, and universities within Florida.

The internal rate of return is "the rate of discount or interest that sets one's stream of lifetime earnings back to its present value and equates this value to one's total

educational costs compounded forward to educational termination" (Leslie & Brinkmam, 1986).

Summary

This study was an attempt to impose Weisbrod's (1961, 1964) theoretical framework concerning the economic and social benefits of additional education onto a dataset which consisted of economic and demographic data from the entire 1980-81 graduating classes of five community colleges. The purpose of the analysis was to examine the relative benefits accrued by Associate in Arts degree graduates who did not pursue a baccalaureate degree as compared to the benefits accumulated by graduates who did pursue further education.

The direct economic benefits were compared using total yearly income, private internal rates of returns, and the yearly incomes of individuals working within the same general job category and the distribution of graduates in each of the SIC Divisions. The social benefits used as a basis of comparison were derived from a comparison of the relative amount of unemployment experienced by individuals within each FATE. Interviews with a small subset of the employers of graduates identified within FATE #1 were used to clarify the perceived credential value of the degree and also the potential availability of educational or advancement opportunities for an individual who holds an Associate in Arts degree.

CHAPTER II
REVIEW OF LITERATURE

Introduction

It is truly rare that the initiation of a new field of study can be traced to a specific point in time and a specific event. The foundations for establishing human capital theory as a legitimate field of study were established as result of a speech given in 1960 by Theodore Schultz to the American Economic Association. In this speech "he observed that human capital formation is an important aspect of economic development and the economic advancement of any country depends to a great extent on its storehouse of human resources" (Alexander, 1986, p. 191).

Prior to the time of Schultz's speech the concept of human capital was considered to be a "metaphor without substantive economic meaning" (Blaug, 1968, p. 11). It was the pivotal work conducted by Weisbrod (1961, 1964), Hansen (1963), Becker (1964), and Schultz (1960, 1967) that created the foundation on which much of the human capital literature and research has been built. During this period of development, the acceptance of the concept of human capital has waxed and waned irregularly, but grew nonetheless. The vast majority of work, which followed the basic application

of capital theory to a stock of human capabilities and potential, has focused on attempting to quantify human capital in terms of relating educational experiences with economic returns in the form of earnings.

> A great deal of work on the subject of human capital is devoted to the estimation of profitabilities, volumes and forms of investment. Empirical calculations are based on comparisons of earnings of workers with differing amounts invested in their human capital. Such calculations follow from the underlying theory that postulates a positive relation between accumulated investments and earnings. The positive and normative importance of the estimated parameters of investment behavior clearly hinges on the degree to which the assumed relation is indeed operative. (Mincer, 1975, p. 72)

Although pecuniary rewards figure prominently in any analysis which incorporates aspects of both investment theory and capital theory, the returns to the individual and to society require that more than just the financial returns to the individual be assessed. Society and its participants interact at an almost infinite number of levels simultaneously, and any attempt to quantify this relationship will, at best, be only an estimate of the totality of the interaction. By far the greatest amount of criticism of analyses that attempt to measure the relationship between education and earnings is that too few of the potential interactions are included in any one model.

Weisbrod (1964) pointed out that the total benefits of public education is the sum of both the social benefits and the "intercommunity spill-over benefits" (p. 17). The social benefits are "anything which pushes outward the

utility possibility function for the society" (p. 17). Examples of social benefits would be anything which increases labor productivity or any other aspect of total production. In addition, anything which reduces the need to incur costs (i.e., law enforcement, welfare, unemployment, etc.) would also be considered a social benefit. Total benefits would have to include both returns to the individual and also those benefits that spill over into the community in general because of the participation of the individual in the financial interactions occurring within their community and the individual's nonmonetary contribution to the community through their participation in family, neighborhood, and community affairs.

General Capital Theory

Capital in economic terms generally "means man-made factors of production: machines, buildings, and other facilities which are themselves produced and used for further production" (Eckhaus, 1972, p. 578). At any given moment a specific portion of this stock of capital will be available for production. In the short run this amount of capital stock is fixed; however, over time investments can be made in this capital stock, and future returns on the investment can be expected. "Over a period long enough to carry through new investment, the supply of capital will depend on the amount of investment undertaken" (pp. 578-579).

Malchlup (1984), in examining common threads of thought within differing definitions of capital, stated

> all theories of capital deal with four fundamental concepts:
> 1. valuable stocks of resources--durable but exhaustible or depreciating
> 2. investment--or accumulation, additions to the stock of resources
> 3. flows of services--or returns, earnings, incomes, benefits and satisfactions attributable to the stock or to any partial investment
> 4. rates of return--or yields, relating the flow of services to the stock of resources or to any investment, any particular addition to the stock of resources. (p. 403)

Capital is therefore viewed as a stock of resources which provides a flow of services (income). This stock of capital also can be enlarged by means of additional investments added to the initial capital and thus increasing the returns earned on these investments.

Human Capital Theory

As noted earlier, human capital theory is only a relatively recent subset of the total knowledge base of the Economics of Education. Schultz (1967), stated that

> the failure to treat human resources explicitly as a form of capital, as a produced means of production, as the product of investment, has fostered the retention of the classical notion of labor as a capacity to do manual work requiring little knowledge and skill, a capacity with which, according to this notion, laborers are endowed about equally. (p. 15)

Schultz further pointed out that

> while any capability produced by human investment becomes a part of the human agent and hence cannot be sold, it is nevertheless "in touch with the market place" by affecting the wages and salaries

> the human agent can earn. The resulting increase in earnings is the yield on the investment. (p. 22)

It was this view of humans as having a potential to build a stock of capital in the form of education, skills, or credentials, that forged the basis for a direct application of capital and investment theory to human beings.

The unifying assumption of almost all literature surrounding the topic of the economics of education is that a relationship exists between educational attainment and income. Juster (1975), in the introductory chapter to Education, Income and Human Behavior, pointed out that

> all investment in humans - taking the form of formal schooling, postschool learning and training in the labor market, or preschool learning and training at home -constitutes part of the accumulated stock of educational "capital" embodied in a person. Consequently, observed differences in the level, distribution, and lifetime profile of financial earnings realized by individuals in the market can, in considerable part, be explained by differentials among persons in their stocks of such capital. (p. 8)

The idea that individuals are endowed with a genetic potential which is reinforced and enhanced by educational experiences is the underlying theme which is woven within the fabric of human capital theory. Schultz (1971) extended the relationship even further by proposing, "The hypothesis is that the structure of wages and salaries is primarily determined by investment in schooling, health, on-the-job training, searching for information about job opportunities and by investment in migration" (p. 63). Schultz was one of the first of the theorists to broaden the view of how humans

can invest in themselves through almost any concerted effort designed to increase their productive potential.

If one accepts the basic theoretical construct that a relationship exists between educational attainment and income, it is then essential to extend human capital theory to its logical boundaries and to examine each component of the construct empirically. The application of capital theory to human capital requires the logical extension that earnings (in the form of wages) is the stream of income received as a result of investment in human capital. Goffman, Davis, and Morall (1972) stated that "capital is a stock of assets that yields a stream of income or utility over time; thus income is the product of capital" (p. 2). The authors then pointed out that

> investment is anything that accumulates capital. . . . An investment in education, in health or in moving to a new area is just as much an investment as a new factory or public bridge. An initial expenditure is undertaken with the hope of generating a higher return of net income in the future. For education, the private costs are the direct tuition and fees associated with schooling, the indirect opportunity costs of not being able to work full time, and the loss of leisure. The higher return is the increase in earnings over what that student would have earned if he had not received the extra education. (p. 2)

Here then are the rudiments of applications of existing theory to a relatively new field. Malchlup (1984), in examining the of the relationship between traditional capital and human capital, stated

> I should hasten to reassure the reader that the previously listed types of investment in human beings do in most other respects constitute formation of capital with all traditional

> characteristics: the capital is durable and yet of limited service life; it calls for maintenance and replacement as does any other exhaustible or "wasting" resource; it may become obsolete before being depleted; and, as far as its subjective value is concerned, it can appreciate as well as depreciate depending on the supply of complementary factors and demand for their joint products. (p. 424)

Malchlup's assessment of similarities between traditional capital and human capital essentially summarizes the view of human capital theorists gained after over 20 years of work.

Theorists also applied investment theory directly to human capital. Goffman, Davis, and Morall (1972) viewed investment in human capital and in physical capital to "differ in degree, not in kind" (p. 2). They also pointed out that

> implicit in applying investment theory to the individual as well as to the businessman is the assumption that both are attempting to maximize their future incomes (including psychic income) in their investment decisions. Thus, they undertake the investment which yields them the highest return, given their available information, and they undertake investments (the best first) until the return on investments equals the interest costs of borrowing or the implicit interest cost of using one's own savings. (pp. 2-3)

With the application of a framework of existing theories to human capital, it was then possible to use an existing empirical methodology for quantifying human capital theory. Most authors recognized that the fundamental analytical tool used to determine the value of any investment is a determination of the rate of return on the investment (Becker, 1960, 1964; Goffman, Davis, & Morall, 1972; Hansen, 1963; Miller, 1960).

Malchlup (1984) recognized "Gary Becker, who together with Theodore Schultz, should be credited with having brought the theory of human capital from the classical state of largely analogical reasoning to the modern state of rigorous logical, algebraic, and statistical analysis" (p. 422). The vehicle primarily used by the aforementioned authors and many others was the rate of return on an investment in education. Rate of return determinations were frequently based on a methodology similar to that outlined in Hansen (1963). The purpose of Hansen's publication was specifically to attempt to reduce the confusion in the interpretation of results from rate of return calculations due to the use of different analytical techniques by different researchers.

> The fragmentary treatment of both the costs of schooling and money returns to schooling found in much of the recent literature provided the stimulus for preparing these internal rate-of-return estimates . . . Given this diversity of treatment, it is difficult to obtain an over-all picture of the relationship among rates of return to different amounts of schooling or to see the nature of the differences between the rates of return as viewed by society and those viewed by individuals. (p. 128)

Almost all of the specific researchers cited in Hansen (1963) were, like Hansen, attempting to develop a methodology to guide individuals in making educational and career decisions, help develop a public policy on educational funding, and also determine the relationship between a nation's economic output and the value of that nation's human capital.

Johns, Morphet, and Alexander (1983) indicated that 1978 was a landmark year in the development of human capital theory because "the ultimate acknowledgment of the importance of human capital research was given in 1978 when the Nobel Prize for Economic Science was awarded to Theodore W. Schultz and Sir W. Arthur Lewis for their efforts in this area" (p. 35). This final recognition of the importance the concept of human capital in assessing economic gain has insured a permanent place for human capital theory within the literature of the economics of education.

The Benefits Derived from Investing in Human Capital

Most authors would agree that the returns on investments in human capital are much more complex than simply a pecuniary return to the individual. Even Hansen (1963) qualified the results of his work by stating "at the outset, it should be made clear that the measured rates of return are money rates of return; any other costs and benefits associated with schooling are excluded from consideration" (p. 129). In making this statement Hansen recognized that the rate of return calculation, while useful, does not begin to assess the total benefits derived by both the individual and society in general from investments in education.

Early in the development of human capital theory, authors recognized that simply determining the financial benefits of investments in education fell short of providing a tool which estimates the "total" benefits derived from

education. The fiscal incentives of educational investments provide the investor with an increased reserve of capital stocks to utilize and this same investment also has a "spill-over effect" (Weisbrod, 1964) to the community in which the investor resides. However, it has repeatedly been noted that there is a diverse array of potential nonpecuniary benefits which appear to be an outgrowth of educational investments.

As noted in the introduction to this chapter, Weisbrod (1964) viewed the benefits derived to be much broader than simply the financial returns received as earnings. Table 2-1 summarizes Weisbrod's view of the benefits derived from educational investment. Weisbrod envisioned that there are direct benefits to the individual and society and indirect benefits which also are beneficial to the individual and the greater society in which the individual is a component. The spill-over benefits which Weisbrod addressed are primarily the indirect benefits accrued by members of the student's family and the community in which the student lives.

Pecuniary returns on investments in education have always dominated the analysis of the relationship between education and benefits to the student and society. However, Taubman and Wales (1973) attempted to demonstrate that in addition to direct pecuniary rewards, educational achievements, as identified by degree(s) earned, can have a benefit in that they can serve as a credential or are used as a screening device by businesses in decisions concerning

Table 2-1

A Summary of the Benefits of Education as Proposed by Weisbrod (1964)

Direct Benefits

Social Benefits

1. Education increases overall labor productivity.

2. Education increases the tax base and reduces the need incur costs of social services (police, unemployment, welfare, social programs).

3. Education increases the general social welfare by the development of more public-spiritedness Student

Benefits

1. Education increases the direct financial returns (income) to the student.

2. Education increases the financial options as measured by the value of the opportunity to obtain further education.

3. Education increases the opportunity options for students by increasing the broadening of individual employment choices.

4. Education acts as a hedge against the "technological displacement of skills" (Weisbrod, 1964, p. 23).

External (Indirect) Benefits

Social Benefits

1. Education produces a literate population which has an inherent value within a social and economic system.

2. Education promotes equal opportunity by providing a route to equal access to opportunities.

Student Benefits

1. Education indirectly increases the family's total productivity by allowing mothers to work outside the home.

2. Education levels of the parents have a positive impact on the educational levels of the children.

hiring or promotion of employees. As a result of such use, education can have a direct impact on income. This would also imply that it is the credential value not the absolute skill level or potential for increasing the businesses productivity that is the primary benefit from investments in education.

Other nonpecuniary benefits also have been perceived as being directly derived from investments in education. These nonpecuniary benefits were drawn from inferences which were extrapolated from complex regression models that used income as the dependent variable and utilized a multitude of potential independent variables in an attempt to examine the explanatory power of different sets of independent variables on income. Bowman (1962) proposed two sets of nonpecuniary benefits

<u>Private Nonmonetary Returns</u>

1. The additional things an educated person can produce for himself because of increased skill or more leisure (e.g. repairs to his house).
2. Psychic returns resulting from a wider array of job opportunities.
3. Added personal or esthetic enjoyments such as reading great literature or music appreciation
* 4. Nonmarket production that his education puts forestalls.
* 5. Enjoyments for which additional education actually disqualifies the participant.

<u>Nonprivate Nonmonetary Returns</u>

1. Voluntary services to the community by the educated who draws on skills acquired in school.
2. Reduced delinquency rates.
3. The psychic income attributable to having educated neighbors.
* 4. The psychic dissatisfaction flowing from awareness of socio-economic failure or negative status (cited in Witmer, 1970, p.516- 517)

The nonmonetary benefits with an asterisk were perceived by Bowman as being negative.

Haveman and Wolfe (1984) in a more recent article listed 19 nonpecuniary effects of incremental education. Their listing of nonmonetary effects are included below

1. Nonwage labor market remuneration
2. Leisure
3. Individual productivity in knowledge production
4. Nonmarket individual productivity (do-it-yourself)
5. Intra-family productivity
6. Child equality through home activities
7. Own health
8. Spouse and family health
9. Fertility
   a) attainment of desired family size
   b) changed tastes for number of children
10. Entertainment - consumption of education for its own intrinsic value and broaden forms of entertainment enjoyed
11. Consumer choice efficiency
12. Labor market search efficiency
13. Marital choice efficiency
14. Crime reduction
15. Social cohesion
16. Technological change
17. Income distribution
18. Savings
19. Charitable giving (pp. 382-386)

As can be seen in the nonpecuniary benefits of investments in education that were suggested by Bowman 1962) and Haveman and Wolfe (1984), the potential nonmonetary benefits are recognized to be many and varied. It would be almost impossible for any single model to measure every possible benefit derived from educational investments.

Measuring the Returns on Investment in Education

Since Schultz's address on human capital established the acceptance of the relationship between education and investment within the confines of human capital theory, a

myriad of researchers have attempted to measure directly the benefits of additional education to both the individual and to society as a whole. The primary focus of this type of study has been an attempt to quantify the value of additional education to the student in order to assist students with decisions concerning exiting or continuing in school. In addition, quantification of both individual benefits and the collective effect of a more educated population were thought to be useful to local, state, and federal decision-makers in determining how much funding should be apportioned to education at all levels.

General Methodology

In summarizing the various approaches to education, Bowen (1968, p. 68) identified four methodologies which have been used, with mixed results, in an attempt to analyze the economic contributions of education:

1. simple correlation,
2. the residual approach,
3. direct returns-to-education approach, and
4. forecasting manpower needs approach.

Simple correlations have been used sparingly in examining the returns to individuals from investments in education. This method of analysis correlates "some overall index of educational activity with some index of the level of economic activity" (Bowen, 1968, p. 68). This technique has been used for evaluating national or international levels of change in total human capital, however, even in

this application, correlations have been of little value. An expansion of simple correlation or simple regression analysis is the application of multiple regression models for examining the interrelationship between income and a wide array of sample demographic characteristics or nonpecuniary benefits of investments in education. The primary advantage of multiple regression models has been that it allows researchers to analyze the impact of educational attainment and income while holding a variety of demographic or individual characteristics constant. Such preexisting factors as age, race, sex, parental socieoeconomic status, individual ability, or motivation have been suggested as potentially impacting on the income and educational attainment of individuals within the sample population in such a way as to interfere with an accurate assessment of the relationship between education and income (Hause, 1975; Mace, 1984; Taubman & Wales, 1973).

The residual approach, as defined by Bowen (1968), attempts to take the total increase in economic output of a country and account for as much of the increase as possible, then identify the difference between the total increase and the accounted for increase. This difference is then the residual which is attributed to unspecified inputs among which changes in the total national human capital is a large component. The obvious weakness in this approach is that the residual is an admixture of ill-defined factors which

have varying amounts of influence on national economic growth.

The direct returns-to-education approach is best represented by the application of investment theory to education, especially postsecondary education. This method is by far the most commonly used approach to quantifying the relationship between income and additional education at the level of the individual student. The tool used to quantify the value of additional education to both income and productivity is the calculation of the rates of return to investments in education. This method contrasts the lifetime earnings of people who have "more" education with the lifetime earnings of those individuals who have had "less" education. "The difference in lifetime earnings can then be expressed as an annual percentage rate of return on costs involved in obtaining an education" (Bowen, 1967, p. 77). This methodology was used as one of the primary tools of analysis within this study and has been addressed in detail in the next section of this chapter.

Although the use of manpower forecasts does provide educational planners information concerning the future needs of business and industry for individuals with specific training, its major shortcoming is that it cannot take into account changes in technology which could occur in the period of time between the date of the forecast and the end of the period projected with the forecast.

> The objective of all "forecasts" (or "projections," the terms will be used interchangeably here) of manpower needs is, of course, to provide persons responsible for educational planning with information as to the likely future needs of the economy for persons with various kinds of training. (Bowen, 1968, p. 96)

Of the four techniques addressed by Bowen, only the correlation (multiple regression) and direct rate of return methodologies were utilized within this study. These two approaches can, in combination, be used to develop a broad-based quantitative analysis of income and educational data which could have application to both the decisions of individual students and educational planners.

Internal Rate of Return

The calculation of an internal rate of return on an investment in education is a pivotal technique utilized since the 1960s as a measure of the "economic value" of differing levels of education.

> studies aimed directly at calculating the economic benefits to schooling . . . are probably the most numerous of all empirical studies in higher-education finance research. Although the rate-of-return studies are frequently characterized by questionable assumptions, poor data, and analytical shortcomings, the topic is so important that efforts do not diminish over time. (Leslie & Brinkman, 1986, p. 207)

In their overview of studies which used internal rate of return calculations, Leslie and Brinkman (1986) cited over 130 publications in which internal rates of return figured prominently in the evaluation of the economic value of investments in education.

Despite the extensive use of the internal rate of return as a tool for evaluating the returns on investments in education, the application of this technique has been plagued by methodological problems. These problems in part are due to limitations imposed by available data, and in part by a lack of agreement on such basic components as what figure should be used for individual income (before or after tax earnings, weekly, monthly, or yearly income, etc.), and how much do individual differences in SES, ability, parental educational levels, and desire to succeed confound the internal rates of return.

Calculation of the internal rate of return. Hansen (1963) was one of the first to outline in detail a methodology to be used for applying rate of return calculations to investments in education. Hansen listed three fundamental steps for the calculation of the rate of return on an investment in education.

> To estimate internal rates of return to investment in schooling we require data on costs--total resource costs and private resource costs--for various levels of schooling as well as data on age-income patterns by each level of schooling. From these, life-cycle cost-income streams can be established that show for each level of schooling the flows of costs incurred during schooling and subsequent flows of additional income that can be attributed to that schooling. The internal rate of return is then estimated by finding that rate of discount that equates the present value of the cost outlays with the present value of the additional income flows. (p. 129)

In quantitative terms, Hansen's description of the methodology for deriving and calculating the internal rate of return is presented in detail in Blaug's (1970) An

$$\sum \frac{(B - C)_a}{(1 + r)^a} = 0$$

B = total benefits for year "a"
C = total costs for year "a"
a = years since most recent degree
r = discount rate used to equate future earnings to its current value [or the rate of return]

Figure 2-1. Formula for Calculating the Rate of Return

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introduction to the economics of education (pp. 54-59) and referred to as the "elaborate method" by Psacharopoulos (1981, pp. 322-323). The most commonly used formula for calculating the internal rate of return on an investment in education is usually stated in a form as shown in Figure 2-1. This formula is used to establish the differential (or marginal) rate of return by calculating the discount rate required to set the differences between the dollar values of two lifetime age-earnings income streams to zero. Each lifetime income stream is usually calculated from census data for groups of individuals having differing levels of education. The primary problem in comparing different rate of return analyses is that different researchers have utilized different assumptions and adjustments to income prior to calculating an internal rate of return.

Methodological considerations. By far, the greatest controversy surrounding the determination and use of rate of return calculations has been the lack of agreement over which set of values most accurately represent the costs and

benefits derived from an investment in education. Table 2-2 is an abbreviated summary of research which features rate of return calculations on data sets derived from U.S. workers (Blair, Finn, & Stevenson, 1981, p. 456; Leslie & Brinkman, 1986, p. 215-220). When discussing the analysis of the publications, Leslie and Brinkman offered this caveat:

> The results are not strictly comparable because of varying data sources, the populations studied, the time periods reflected, the social and private cost specifications, the controls and adjustments made, the dependent variable specification, the inclusion or exclusion of nonpecuniary or psychic variables, and whether the study was of cross-sectional or time series data. Primarily because of differences in controls and adjustments, the results could not be standardized readily. (p. 214)

This statement is an excellent assessment of the state of rate of return calculations in general. Because of the lack of uniformity and the confusion surrounding methodology, it is almost impossible to compare rates of return calculated by different researchers.

Many of the analyses in Table 2-2 calculate both a social and private rate of return. The social rate of return is of particular value in developing cost-benefit analyses that can be used for guiding governmental policies and fiscal allocations. The private rate of return is of value to the individual when making a decision among the available economic alternatives offered by education and employment (Psacharopoulos & Woodhall, 1985, p. 33).

Table 2-2

Comparison of Rates of Return in Previous Studies

Year	Author(s)	Level	Data Source	Dependent Variable	Private IRR(%)	Social IRR(%)
1975	Becker	HS Col.	1939,1949 Census	Earnings	10.0	13.0
1981	Blair, Finn & Stevenson	HS,AS, 1yr of Col.	1972 Man-power Survey	Earnings 10yrs 20yrs 35yrs	8.2 13.9 14.9	
1975	Carnoy & Marenbach	E,HS Col.	1939,1949 1959,1969 Census	Annual Income & Earnings	14.3	9.3
1973	Eckhaus	E,Col.	1959 White Males 14-64 Census	Hourly Wage	11.5	
1975	Freeman	HS, Col.	1959,1969 1972,1974 Census,CPS	Annual Earnings	10.4	9.7
1967	Hanoch	HS, Col.	1959 males Census	Annual Earnings	10.0	
1963	Hansen	E,HS Col.	1949 males Census	Income	10.1	10.2
1982	McMahon & Wagner	Col.	1976 B.A. graduates	Annual Earnings	18.0	13.3
1962	Mincer	Col.	1950 Census	Pre-tax income	11.0	13.0
1975	Raymond & Sesnowitz	Col.	1969 Census	Annual Income	15.7	14.3
1973	Taubman & Wales	HS, Col.	1955,1969 Male air cadets	Pre-tax monthly earnings	9.0	8.0

Abbreviations: E = elementary school, HS = high school
AS = technical Associate degree
Col. = college graduates
CPS = current population surveys

By necessity, the social internal rate of return and the private internal rate of return require different types of inputs for the costs and the benefits used in the calculation of an internal rate of return. The benefits clearly are wages or earnings accumulated during a lifetime. The costs are less distinct and differ dramatically between social and private rates of return. For the social rate of return typically not only are the individual's direct and indirect costs used, but the cost to the community for supplying the educational service must also be included. "The total cost of the resources that society devotes to education includes the cost of teachers and other staff, books, other goods and services such as heating and lighting, and the value of the buildings and equipment" (Psacharopoulos & Woodhall, 1985, p. 35).

The costs used in calculating the private internal rate of return are the direct and indirect costs to the individual of securing an education. Private rate of return are certainly effected by the tuition and peripheral costs of attending school, but the private rate of return is most heavily influenced by the amount of income foregone while attending school. The total costs used in previous work (Becker, 1975; Hansen, 1963; McMahon & Wagner, 1982; Mincer, 1962) were calculated by combining the direct costs and the estimated or reported forgone income. In most cases the forgone income was established by using 75% of the mean high school graduate's income (usually from Census data) or by

requesting that the subjects estimate their own lost income. These figures were then incorporated into the calculation of the internal rate of return.

If foregone income is the primary influence on rate of return calculations, a second factor which was frequently cited as heavily influencing the internal rate of return on investments in education is individual differences such as innate ability, parental education, SES, or motivation.

> The income differences between the various educational categories are likely to overstate the effect which education has on income since those obtaining more income are apt to have greater ability. Much work has been done in recent years in attempts to separate the effects of education and ability on earnings, but no clear consensus appears to have been reached. Empirical work is hampered by a lack of data, by the interaction between the explanatory variables, and <u>by the absence of a measure of ability which is independent of education</u> [emphasis added]. (Raymond & Sesnowitz, 1975, p. 143)

The fundamental problem in assigning a specific correction factor that adjusts earnings for differences in individual abilities or family background is choosing a reliable tool which accurately measures these characteristics. Previous researchers have produced inconsistent estimates when attempting to establish a definitive relationship between individual factors and differing levels of education or earnings.

> Estimates of the upward bias on rate-of-return estimates due to omission of ability and other personal traits range from practically nothing (Griliches, 1977) to perhaps 35% (Cutwright, 1969). Among those who have attempted to measure the ability bias are Taubman and Wales (1975), Griliches and Mason (1972), Hause (1972), and

> Weisbrod and Karpoff (1968). (Leslie & Brinkman, 1986, p. 212)

Leslie and Brinkman (1986) offered a rather complete overview of the literature surrounding the ability controversy. They briefly consider the "alpha coefficient" (Leslie and Brinkman refer to it as the "alpha factor") when examining empirical results of previous research. The alpha coefficient is a mathematical correction applied to gross earnings in an attempt to adjust downward income differentials so only that portion of the total earned income which is directly attributable to education is utilized for analysis. It was originally proposed by Denison (1964) and called the alpha coefficient in Blaug (1970).

> After examining the evidence of the Wolfle-Smith Survey, Denison concluded that about 66 per cent of the gross earnings differentials between college and high school graduates can be statistically attributed to education alone, in the sense that on the average about a third of the earnings differentials disappear when one standardizes for differences in father's occupation, rank in high-school class and I.Q. scores (Denison, 1964, p.78-9), a result which has been confirmed by Becker (1964, p.80-88) and by Weisbrod and Karpoff (1968)...On the whole we shall not go far wrong in analyzing American data if we simply multiply the gross earnings differentials between college and high-school graduates by what we will call an <u>alpha coefficient</u> of 0.66 (alpha as a mnemonic for 'ability'), leaving education substantially unaffected as a generator of higher future earnings. (Blaug, 1970, pp. 51-52)

Leslie and Brinkman (1986) reviewed only 13 studies which included an alpha coefficient. They found that

> the average alpha value for thirteen studies of the B.A. degree is 0.79; that is, the portion of

> the difference in earnings between B.A.-holders that and non-B.A.-holders that can be explained by the B.A. is 79%. Values tend to be lower for two-year and technical degrees. Alpha values of 0.90 are found for the graduate level. (p. 214)

Malchup (1984) asserted that "test scores, it is agreed, cannot without reservation be accepted as measures of ability" (p. 483). His reasoning was that there were not "equally trustworthy proxies" available for ability and capacity. Taubman and Wales (1975) pointed out that "these differentials [in incomes at different levels of education] are independent of ability level except for graduate students" (p. 98). Further, they stated

> in our study of initial salaries, we find that mental ability has no effect on income except for those with graduate training . . . ability initially has little effect on earnings, but that over time the effect grows, and perhaps grows more rapidly for those with graduate training and high ability. (p. 101)

Taubman and Wales (1973) presented data which they contended supports the hypothesis that education is primarily used by business as an inexpensive screening technique for initial placement. They described the labor market based on a model built around a slightly different set of assumptions.

> These conclusions on ability and education suggest the following model for the labor market: For most jobs, firms either have little or no idea of what determines success or must engage in so much training and testing that the initial output of all employees without previous experience is similar. In either case, firms pay all those in comparable positions the same amount initially and then monitor performances and base promotions and income on accomplishment. (p. 102)

Gintis (1971) took another approach to the ability question, Gintis suggested that education does not raise cognitive

skills as much as it inculcates changes in personality traits which influence personal income growth.

When all components of the ability issue are considered together, at best, the admixture of results indicate that if individual academic or intellectual ability effects income, its effect is a relatively small proportion of the total income. In addition, ability as measured by standardized testing may not be a reflection of an ability which impacts directly on earnings. Leslie and Brinkman (1986) pointed out "still others argue that the so-called ability issue in rate of return estimates is a nonissue, that ability in this regard is ability to earn, and that is what the dependent variable measures" (p. 212).

Nonpecuniary Returns

A discussion of the measurement the benefits of additional education would not be complete without a brief consideration of the nonpecuniary returns resulting from additional education. Weisbrod (in Bowen, 1968, p. 99) stated that "benefits from education may indeed take many forms, some of which--and possibly the most important--defy measurement in money terms". The nonpecuniary returns consist of any benefit gained from an education which is not related to income directly. These nonpecuniary returns typically are relatively esoteric and at best, difficult to measure. Malchup (1984) pointed out that private nonpecuniary benefits consist of

> the various satisfactions that the student (or his family) derives at the time from his school attendance and, in later years, from the education received in the past. (Since appraisals of money equivalents of such psychic incomes would be entirely subjective on the part of the individuals and not ascertainable by any statistical-census taker, nonpecuniary benefits are, as a rule, omitted from estimates of returns on educational investment). (p. 433)

Duncan (1976) proposed three sources of nonpecuniary earnings or benefits in the work place. "It is useful to categorize nonpecuniary job benefits as (a) fringe benefits, (b) general working conditions, and (c) consumption benefits" (p. 467). The fringe benefits would include "goods, services or deferred money income received by the employee but paid for by the employer" (p. 467). The general working conditions would include "the health and safety characteristics of the job, the rigidity of the work schedule, the degree of work autonomy afforded to the worker and the characteristics of the grievance procedures" (p. 468). Finally, the consumption benefits are those benefits which provide the employee satisfaction by the work situation. "Most consumption benefits represent subjective reactions of individuals to the job situation" (p. 468).

Haveman and Wolfe (1984) cited 19 specific impacts of schooling, most of which were nonpecuniary. The impacts listed range from leisure and entertainment value of education to consumer choice efficiency and the ability to limit one's family to a specific size.

> Our review of the evidence leads to the following conclusion for some of the indirect effects: schooling tends to increase the ability of

> families to achieve their desired size and avoid "unwanted children" through more efficient contraceptive use. In addition, parents with more schooling appear to have greater efficiency in producing higher quality children (in terms of health and intellectual development) . . . Schooling also appears to lead to greater efficiency in consumption and, hence, greater utility through an improved market basket of expenditures. The efficiency of choices in both the labor and marriage markets are also likely to be enhanced by additional schooling, and migration decisions will tend to be more informed and, hence, more successful. (Haveman & Wolfe, 1984, p. 389-90)

Despite the fact that it is obvious that all income earned by individuals is not the direct result of education, to attempt to assess the nonpecuniary benefits of additional education and assign a monetary value to the these benefits in an attempt to adjust a marginal rate of return value would add little to a cost-benefit analysis and would only be of limited value to a more subjective evaluation of decisions to pursue further education.

Rate of Return on an Associate in Arts Degree

Because most previous work producing internal rates of return on education in the United States have been based on census data, very little research has been focused on the Associate in Arts degree specifically. Typically, census data consist of educational information which has been limited to responses that include a high school diploma, 1-3 yrs of college, a baccalaureate or graduate degree. The Associate in Arts degree is usually included in the same category as students who dropped out of a four year college or university. Taubman and Wales (1973) noted that

> a surprising result is that the rate of return to a college dropout exceeds that to a college graduate. This result might in part be attributed to a heavy concentration in the some-college category of self-employed individuals whose earnings probably include a return to financial capital. (p. 108)

Blair, Finn, and Stevenson (1981) examined 8,977 individuals categorized as having technical careers. They segregated the sample into five categories: one year of college, two years of college, three or more years of college, associate degree, and bachelor degree technicians. Each category had a rate of return calculated. The associate degree technicians had a calculated rate of return of 9.0% and individuals with one or two years of college had a rate of return of 4.9% and 6.0%, respectively.

The most recent work with associate degree graduates was done by Romano (1986). Romano attempted to estimate the lifetime income streams of two-year associate degree graduates by extrapolating from high school graduate and baccalaureate degree graduates. He stated,

> Very few studies of this type have been done on the 2-year graduates, chiefly due the lack of national data on this group. On a priori grounds, however, we might expect the rate of return to a 2-year graduate to be somewhere between that of a high school graduate (usually in the 13-20% range) and a 4-year college graduate (usually in the 8-15% range). (p. 158)

Romano never did calculate an internal rate of return either, however, he did note "the few more reliable efforts to estimate an internal rate of return to the 2-year graduate do appear to show higher rates of return than those to the 4-year graduate" (p. 158).

It is because of the paucity of data that this study was undertaken. The value of the Associate in Arts degree must be evaluated not only in light of the number of graduates transferring but also in light of its value in the job market to the graduate who does not pursue further education.

Summary

A review of the literature surrounding the concept of human capital theory and the techniques utilized for measuring the returns on investments in education revealed little in the way of guidance to the researcher who is seeking a specific methodology. First, there has been little agreement among studies on a concrete methodology for comparing differential incomes between groups of individuals with differing levels of education. Second, even if an internal rate of return calculation was performed, there has been little agreement between prior studies on such basic issues as the costs which should be included, and how the earned income should be adjusted to account for the contribution of education to earnings, the nonpecuniary benefits of some jobs, or the mortality or unemployment rates for the individuals in the samples.

It is because of this disagreement that it is almost impossible to compare different studies of graduates done on different samples in different years. It is therefore incumbent on the researcher to choose a methodology which meets the needs of the particular study undertaken and to

describe any and all adjustments made on the raw income data in order to define all prior assumptions and treatments imposed on the data. It is only through a careful description of the methods employed that each study can be assessed and evaluated in light of existing theoretical constructs.

CHAPTER III
METHODOLOGY

Introduction

Historically, the analysis of the contribution of education to both society and the individual has been determined by the use of investment theory and the calculation of the rate of return on an investment in human capital. As was noted in Chapter II, the rate of return can be determined for society in general by determining the social rate of return and for the individual through the private rate of return.

Because of the desire for this analysis to reach beyond simply the financial impact of the completion of an Associate in Arts degree, the data collection consisted of three interdependent steps. The data analysis, by necessity, also required a series of both quantitative and qualitative assessments of specific aspects of the economic and social value of the Associate in Arts degree to the graduate who does not attempt to complete a Baccalaureate degree.

The Collection of Data

Phase I: Selection of the Initial Sample

In an attempt to represent as diverse a population as possible, data were requested from five community colleges. These colleges were selected based on the institution's geographic location within the state, its size, and the availability of data. The institutions chosen for the study represented three geographic regions of the state, both coasts as well as the central corridor of the state. Institutional size ranged from approximately 1,000 FTE to approximately 10,000 FTE. Four institutions are also designated vocational/technical centers that offer a broad range of courses, and while the remaining institution has technical programs, it has proportionally more emphasis placed on the transfer program and the Associate in Arts degree. Each participating institution submitted a data tape or a typed list of the 1980-81 (Fall 1980 through Summer 1981) Associate in Arts graduates. The data were requested in the Division of Community Colleges Feedback Data Tape format or include the following data elements:

1. social security number,
2. last name,
3. first name,
4. sex,
5. race, and
6. age (if available).

These data elements were assembled into a single data set and compared to data sets contained within the SUS Student Data Course File for each semester from Fall 1981 through Fall 1987. The two data sets were cross-matched on the Associate in Arts graduates' social security numbers. From this cross-matching all of the 1980-81 Associate in Arts graduates could be separated into three subsamples which have been referred to as FATE #1, FATE #2, and FATE #3. FATE #1 consisted of the Associate in Arts graduates who had not registered for courses within the state university system or who have not made significant progress towards a baccalaureate degree (<13 total credit hours). FATE #2 included only those Associate in Arts graduates who successfully transferred to a state university and completed 13 or more credit hours but who had not graduated prior to Fall 1987. Finally, FATE #3 contained all Associate in Arts degree graduates who successfully transferred to a state university and completed a baccalaureate degree or were registered for postbaccalaureate courses.

In addition to subdividing the 1980 graduates into three FATEs, the cross-matching of the Associate in Arts graduate data set with the SUS Student Data Course File captured the following additional data elements.

1. birth year,
2. term last enrolled,
3. term of initial enrollment,
4. tenure (length of time between entry and exit),

5. highest degree prior to entry,
6. current degree sought,
7. class level,
8. semester in which degree was granted (if any),
9. total credit hours attempted,
10. total credit hours for GPA,
11. total grade points for GPA, and
12. GPA.

Some of these additional data elements were used for subsequent analyses and the ultimate interpretation of the results of the analyses. The final data set was then transferred from a mainframe environment into PC environment and subjected to further analysis.

Phase II: Accumulation of Economic Data

Once the initial raw data from the participating community colleges had been subdivided into FATEs and had the SUS data appended to the subsamples, a second data collection was required. At this point in the data collection process, only demographic and educational data had been incorporated into the data set. Economic data on each individual graduate was available through a state funded program--The Occupational Identifier Project (OIP) of the Department of Education. The state Department of Labor Statistics, Unemployment Insurance data base was accessible through the OIP for educational research. Within this database the following data elements were available.

1. social security number of graduate,
2. employer name,
3. employer address,
4. contact person at employer,
5. employer Standard Industrial Classification,
6. employee number,
7. employee quarterly income, and
8. number of weeks worked during each quarter.

Again using the graduates' social security numbers, these data elements were appended to the three FATE determined data sets. With the incorporation of the data elements from the OIP, all of the data needed for the quantitative components of the analysis were finally incorporated into the three data sets. What still was lacking was the subjective evaluations of the graduates' employers concerning the value of the graduates' investment in their personal human capital. A systematic sample of 200 graduates was drawn from each FATE for use in the rate of return calculations. For all other quantitative analyses the entire data set for each FATE was used.

Phase III: Employer Interviews

Because the focus of the research was on the Associate in Arts graduates who were included in FATE #1 and because interviewing each employer of all 601 graduates in FATE #1 was not practical, it was necessary to draw a subsample from the graduates in FATE #1 for individual interviews. A subsample of individuals in FATE #1 was drawn in such a way

as to provide a systematic sample equal to 5% of the total FATE #1 sample. This subsample was drawn from all FATE #1 graduates employed full-time or part-time during any of the five quarters included in the data set. The employers of the individuals selected in the FATE #1 subsample were interviewed by phone in order to assess both the employers' perceived value of an Associate in Arts degree within the context of a hiring decision and also the employers' subjective evaluation of the skills and abilities that an Associate in Arts degree graduate brings into the workplace.

Analysis of the Data

Overview

As has been pointed out previously, the full measure of the economic and social value of education must include more information that just the amount of income graduates receive or the rate of return on an investment in education. Economic data can be used to estimate the total monetary returns to an individual or the society in which the individual lives; however, education can also act as a credential to provide additional opportunities or education can instill in the individual, skills and personal qualities which are at best difficult to quantify.

Weisbrod (1964) pointed to several nonmonetary benefits which education can provide an individual. Among these advantages were (a) a financial option return which was primarily the option for gaining additional education, (b) an opportunity option which provided individuals a broader

array of employment opportunities, and (c) a hedge against technological displacement of skills.

This analysis was designed to examine both the monetary and nonmonetary benefits accrued by community college graduates who secure an Associate in Arts degree. The analysis examined the returns to graduates on their investments in their own human capital within the context of Weisbrod's (1964) framework of benefits. Specifically the analysis utilized both quantitative and qualitative methodologies to develop a portrait of the value of an Associate in Arts degree to a graduate who utilizes that degree within the employment market. Each technique was used to extract the greatest meaning from the available data and also provided a harmonious blend of information that improved the quality of the total analysis. This blending of analytical techniques also allowed for a closer alignment of the total benefits to Weisbrod's theoretical constructs. An overview of the total analysis and its alignment with Weisbrod's benefits appears in Table 3-1.

Question #1

> Does the private rate of return on an investment in education for an individual with only an Associate in Arts degree compare favorably to the rates of return for individuals who secure additional education?

The private rate of return as used by Hansen (1963) is a straight forward calculation which determines the rate of discount which equates the present value of the total cost of an investment to the present value of a stream of

Table 3-1

Overview of the Analysis

Weisbrod' Benefit	Analytical Technique
Analysis of Economic Value	
1. Increased direct economic returns.	(a) A comparison of the internal rate of return for all three FATES.
	(b) An ANOVA comparing the mean annual incomes of each FATE and an ANOVA comparing the mean annual incomes of each FATE within each SIC Division.
2. Increased financial returns (options for further education or training).	An analysis of employer option responses to a set of questions relating to available on-the-job training or educational opportunities.
3. Increased opportunity options (availability of other employment).	(a) Cross-Tab and Chi-Square analysis of the distribution of graduates within each SIC Division for FATE #1 and FATE #3.
	(b) An analysis of the employer responses to a set of questions concerning the use of the Associate in Arts degree in hiring and promotion decisions.
4. Acts as a hedge against the displacement of skills due to technological change.	Analysis of employer responses to questions relating to the graduates' relative ability and willingness to learn new skills.
Analysis of Social Value	
1. Greater labor productivity.	ANOVA of the mean number of weeks employed within each FATE.
2. Increased tax base.	
3. Reduced need to incur costs.	

$$\sum \frac{(B - C)_a}{(1 + r)^a} = 0$$

B = total benefits for year "a"
C = total costs for year "a"
a = years since most recent degree
r = rate of return

Figure 3-1. Formula for Calculating the Rate of Return

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earnings. The earning stream is the income derived from an investment in human capital. In essence the rate of return calculation deducts the total costs of an investment from the future benefits that were derived from the investment and allows for the calculation of a discount rate which equates future earnings to the present value of the earnings. It utilizes the formula shown in Figure 3-1.

The method utilized for this analysis closely follows the three step analysis based on Hansen (1963) and outlined by Psacharopoulos (1981) where it is described as the "elaborate method". Psacharopoulos explained that the first step is to develop an age-earnings profile for each educational level. This profile will usually "exhibit a saw tooth pattern making the rate of return estimation very sensitive, especially regarding the initial years after graduation" (p. 323). For this reason he recommends the use of the following regression equation to smooth the data.

(2) $$Y_i = a + b_1(AGE_i) + b_2(AGE_i)^2$$

Y_i is the income in year "i" and AGE_i is the age in year

"i". Eckaus (1973, p. 84) recommended the use of a slightly different equation for regression smoothing of the raw data. Eckaus suggested the model

$$\log Y_i = a + b_1(AGE) + b_2(t)^2 \quad (3)$$

where "t" is the number of years since an assumed age of entry into the workforce. Psacharopoulos's model yielded a very low R^2 for all three groups (<0.05). The Eckaus model yielded much higher R^2 value, especially when the actual yearly earnings were used instead of the logarithm of the yearly earnings. The model ultimately used to smooth the yearly earnings for the age-earnings profile was

$$Y_i = a + b_1(AGE) + b_2(t)^2. \quad (4)$$

The second step following the smoothing of the data was to construct an idealized age earnings profile using predicted values from the regression equation. Finally, the predicted values are used to calculate the rate of return using equation listed in Figure 3-1. However, before the rate of return can be calculated, it is necessary to determine the costs and benefits incurred during and after education.

Costs. The total costs surrounding an investment in education would by, necessity include a variety of monetary expenditures (i.e. tuition, books, transportation) in addition to the income which was lost during the time the student devoted to education in lieu of working or leisure. Psacharopoulos and Woodhall (1985) pointed out

> The cost of any investment must be measured by its opportunity cost, rather than simply by monetary

> expenditures. Economic (as opposed to financial) analysis of investment in education thus attempts to estimate the total cost of an investment in terms of alternative opportunities foregone. (p. 33)

In this analysis the total direct costs of an investment in education will be estimated by averaging the total costs used by each college or university for financial aid purposes during the 1980-81 academic year. These include the cost to the student for courses, supplies, fees, books, and transportation. Added to the total direct costs were earnings foregone due to attending a community college or university. All data except the estimate of income lost were provided by the participating institutions. The total costs used in previous work (Becker, 1975; Hansen, 1963; McMahon & Wagner, 1982; Mincer, 1962) were calculated by combining the direct costs with the estimated or reported foregone income. In most of the previous work the foregone income was estimated by using 75% of the mean high school graduate's income (usually from census data) or by requesting that the subjects estimate their own lost income. For this study the foregone earnings were conservatively estimated by using 75% of the earnings of a hypothetical individual working 40 hours a week at the federal minimum wage for each year the graduate was in school. The federal minimum wage for the year 1980 was used to calculate the forgone earnings.

Income. The income used within the rate of return calculation was the total yearly earnings. This information

was provided in the data elements extracted from the state Department of Labor Statistics data base. In order to insure that the current income figures represent the same number of weeks worked per year, the average weekly income was determined for each individual by calculating average weekly income per quarter. The quarterly weekly average earnings per individual were averaged for all quarters worked and the final average weekly earnings was multiplied by 52 in order to establish a common time frame and wage calculation for all individuals within the sample. This method of using weekly earnings times a standard year was recommended by Eckhaus (1973).

Once the cost and yearly income data were estimated, an age-earnings profile could be developed. From these data, the rate of return for a systematically selected sample of approximately 200 graduates in each FATE was determined.

Question #2

> Do the annual incomes of Associate in Arts degree graduates who do not transfer to the university differ significantly from the annual incomes of Associate in Arts degree graduates who pursue further education when the graduates are employed in the same general business field?

Quarterly income data received within the data elements captured in Department of Labor Statistics data base were converted to average weekly incomes and used to calculate a standardized yearly income. The yearly income data were analyzed using a multiple regression model for an analysis of variance. An analysis of variance was used at two separate levels. The initial analysis of variance compared

the mean aggregate yearly income for each of the three FATEs.

Level 1. Is there an aggregate difference between FATEs? Using the model

$$Y = a + b_1X_1 + b_2X_2 + e$$

Where:

Y = yearly income
X_1, X_2 = dummy variables

Testing the Omnibus F statistic where

$$H_0: u_1 = u_2 = u_3.$$

If the results of this analysis indicated that there was a significant difference between the mean yearly incomes of the three identified FATEs, then each pair of income means were tested individually using Bonferroni's t.

Testing for: $H_{01}: b_1 = 0$ or $H_{01}: u_1 - u_3 = 0$

Testing for: $H_{02}: b_2 = 0$ or $H_{02}: u_2 - u_3 = 0$

Testing for: $H_{03}: b_1-b_2 = 0$ or $H_{02}: u_1 - u_3 = 0$

Level 2. Is there a difference between mean yearly incomes of individuals in each FATE by Standard Industrial Classification (SIC) Division? Table 3-2 displays a listing and description of each SIC Division. For the purpose of this analysis each SIC Division in which there were at least ten or more individuals in each FATE, were tested separately using the model

$$Y = a + b_1X_1 + b_2X_2 + e$$

where

Y = yearly income
X_1, X_2 = dummy variables.

Table 3-2

Standard Industrial Classification Divisions

Division		Type of Industry (No. of Major Groups)
A.	0000-0999	Agriculture, Forestry and Fishing (5)
B.	1000-1499	Mining (4)
C.	1500-1799	Construction (3)
D.	2000-3999	Manufacturing (20)
E.	4000-4999	Transportation, Communication, Electric, Gas and Sanitary Services (10)
F.	5000-5199	Wholesale Trade (2)
G.	5200-5999	Retail Trade (8)
H.	6000-6799	Finance, Insurance, and Real Estate (7)
I.	7000-8999	Services (16)
J.	9100-9799	Public Administration (6)
K.	9900-9999	Nonclassifiable Establishments (1)

This tests the Omnibus F statistic where

$$H_0: u_1 = u_2 = u_3.$$

If the results of this analysis indicates that there was a significant difference between the mean salaries by FATE within a single Division, then each pair of income means were tested individually using Bonferroni's t.

Testing for: $H_{01}: b_1 = 0$ or $H_{01}: u_1 - u_3 = 0$

Testing for: $H_{02}: b_2 = 0$ or $H_{02}: u_2 - u_3 = 0$

Testing for: $H_{03}: b_1 - b_2 = 0$ or $H_{02}: u_1 - u_3 = 0$

Question #3

> Do Associate in Arts graduates who do not transfer to a university have available a different array of potential employment opportunities than graduates who pursue further education?

This research question was answered through the use of a contingency table and chi-square analysis of the overall distribution of graduates within each Standard Industrial Classification (SIC) Division (see Table 3-2) to determine if there was a proportional distribution of graduates within FATE #1 and FATE #3. The SIC Job Category Code for each graduate was included in the data elements extracted from the state Department of Labor Statistics database. A second cross-tabulation and chi square analysis was performed comparing the distribution of graduates in FATE #1 and FATE #3 for each SIC Division. The chi square statistic was used to determine if there was a significant difference in the distribution of graduates from FATE #1 and FATE #3 within each SIC Division.

In addition to the analysis of the distribution of individuals within SIC Divisions, additional data were collected from the employer interviews. These data were analyzed by clustering similar responses and qualitatively examining the pattern(s) suggested by the employer responses to questions concerning the use of education in hiring and promotion decisions. The following questions were asked of representatives of each of the organizations which were identified as having employed the graduates in the 5% subsample of FATE #1.

Employer Interview

1. Do you know how many Associate in Arts degree graduates are employed by your organization?

2. How does this organization use an individual's education, specifically an Associate in Arts degree, in a determination of an individual's starting salary?
3. How is an Associate in Arts degree used in promotion or hiring decisions?

4. Does your organization have any positions which require a minimum of an Associate in Arts degree or two years of college?

5. Does your organization have any on-the-job training programs for your employees?

6. How does your organization encourage employees without a baccalaureate degree to pursue further education?
   Prompt: Are employees given any special encouragement for further education by tuition/ book reimbursement, or by modifying schedules?

The responses from the questions listed above were analyzed at three levels (Miles & Huberman, 1984). Initially, during and immediately after an interview, comments were grouped using (a) pattern coding. Once the data were aggregated by patterns, (b) each cluster of data elements was examined and analyzed in an attempt to derive relationships within the clusters. Because the questions are concerned with a linear process (hiring practices -> on-the-job training or educational opportunities-> advancement opportunities) the clusters of data were analyzed by (c) building a logical chain of evidence linking the employer-reported opportunities available at hiring, and the use of education in hiring or promotion decisions. In addition each employer was queried concerning the organizational

policies towards assisting employees secure additional education. The combination of the responses were then used to segregate employers into clusters with similar organizational postures towards hiring Associate in Arts degree graduates and providing the graduates with additional educational opportunities.

Question #4:

> Do the employers of non-transferring Associate in Arts degree graduates perceive that the experiences or skills gained as a result of additional education serve as a hedge against technological change by enhancing the individual's productivity or an employee's willingness or ability to learn new skills.

Weisbrod (1964) pointed out that one of the direct benefits realized by the student is that

> Education may be viewed as a type of private (and social) hedge against technological displacement of skills . . . New technology often requires new skills and knowledge; and those persons having more education are likely to be in a position to adjust more easily than those with less education . . . [this hypothesis] suggests the following implication: the higher the level of an individual's formal education attainment, the more he can benefit from additional on-the-job training. (p. 23)

The critical factor in this instance is the generic nature of education and the ability to transfer learning skills and the willingness to learn to new settings, such as the work environment. Education should increase an individual's readiness to accept new knowledge, the student or recent graduate should be more willing and more capable of the intellectual retooling needed to prepare themselves for the use of new technology on the job or in an academic environment.

In order to assess the employers' recognition and encouragement of the Associate in Arts degree graduates' abilities and willingness to continue to learn on the job, the following questions were addressed to the employers of the FATE #1 subsample.

Employer Interview

1. Does your organization have any positions which require a minimum of an Associate in Arts degree or two years of college?

2. How does this organization use an individual's education, specifically an Associate in Arts degree, in hiring decisions?

3. How does this organization use an individual's education to determine starting salary?

4. Does your organization have any on-the-job training programs for your employees?

5. How does your organization encourage employees without a baccalaureate degree to pursue further education?
   Prompt: Are employees offered tuition or book reimbursement? Can employees arrange work schedules around classes?

6. What skills and abilities do you perceive that an individual with an Associate in Arts degree brings into the workplace?

7. If an individual is hired with a high school diploma and while employed by your organization they complete their Associate in Arts degree, would they automatically get a raise or any other consideration.
   Prompt: Would there be a greater array of potential jobs available to the graduate because of the completion of additional schooling?

The data from the questions above were analyzed at three levels (Miles & Huberman, 1984). Initially, during and immediately after an interview, comments were grouped using

(a) pattern coding. Once all the data were aggregated by patterns (b) each cluster of data elements were examined and analyzed in an attempt to derive relationships within the clusters. Because the questions are concerned with a set of complex interactions between a graduate's willingness to learn and skill at learning, an initial conceptual framework in which the clustered data will be analyzed is provided in Figure 3-2. This framework is a logical extension of Weisbrod's view of education acting as a hedge against the "vicissitudes of technological change" (Weisbrod, 1964, p. 23).

Question #5

> Do non-transferring Associate in Arts degree graduates experience significantly less time unemployed than Associate in Arts degree graduates who secure a baccalaureate degree?

One of the most prominent social benefits derived from investments in education, is the increase in productivity derived from increases in human capital (Weisbrod, 1964). Weisbrod defined increased productivity as "anything which increases production possibilities or anything which reduces the need to incur costs" (p. 17). Employment and unemployment are two sides of the same coin because both increased employment and decreased unemployment have the same net effect of increasing labor productivity and reducing costs to society respectively.

One of the data elements included in the information provided by the state Department of Labor Statistics database was the number of weeks worked per job per quarter

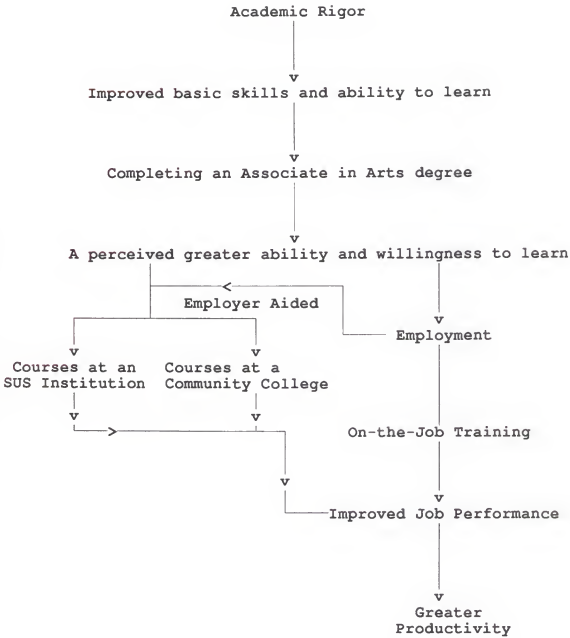

Figure 3-2. Proposed Conceptual Framework Based on Weisbrod's "Education as a Hedge Against Technological Displacement of Skills"

for each individual in each of the three FATEs. If unemployment rates are inversely related to the educational levels of workers, as has been proposed by a number of researchers (Ashenfelter & Ham, 1979; Nickell, 1979), then the mean number of weeks unemployed per quarter should decrease as the total amount of education increases. In addition a lower level of unemployment would also imply a lower social cost to the community in which the individual is living. Productive individuals who work to support themselves and their families reduce the cost of social programs such as Unemployment Compensation, Welfare and Aid to Dependent Children by not needing this type of help.

In order to ascertain the relationship between unemployment and educational attainment, the total number of weeks employed per worker for both all five quarters and also for a standardized year were compared between FATEs by the use of a 1 x 3 analysis of variance. The three FATEs were compared on the mean number of weeks spent employed for all five quarters and for a standardized year. This analysis tested the following hypothesis.

$$H_{01}: u_{FATE1} > u_{FATE2} > u_{FATE3}$$

From this analysis it was possible to determine the relationship between the aggregate unemployment rates by FATE.

Summary

When viewed in totality, the data analysis was an effort to analyze the value of an Associate in Arts degree

to a graduate who does not pursue a Baccalaureate degree within the general framework of Weisbrod's definition of the benefits of education. Weisbrod (1964) pointed out that the benefits to the individual can be direct--income, increased productivity--or they can be indirect, through members of the graduate's family or the community in which the graduate resides.

In this study the direct economic value of an investment in education was estimated by a comparison of the rate of return on the graduates' investment in education by FATE and also a direct comparison of incomes within each SIC Division. The second portion of the analysis was an attempt to assess if there was a difference in available employment opportunities for graduates in FATE #1 than there were for graduates in FATE #3. The third segment of the analysis examined which skills were perceived by the employer as having been brought to the work place by the Associate in Arts degree graduate and the impact of acquiring these skills on the ability to learn new skills.

The final component of the analysis utilized the rates of employment for Associate in Arts degree graduates in each of the three FATEs in order to ascertain the differences in the mean length of time individuals in each FATE were employed. Employment in this context was used as a surrogate for both increased productivity and decreased costs to society. If Weisbrod was correct and the total benefits derived from an education consists of both direct

and indirect economic and social benefits, then this analysis was an attempt to examine a segment of the multitiered complex of benefits which interact to define an estimate of the total benefits associated with the completion of an Associate in Arts degree to a graduate who experiences an eight-year educational hiatus following graduation.

CHAPTER IV
RESULTS

Introduction

The primary purpose of this study was to identify and characterize a population of community college graduates who have been almost completely ignored by researchers examining the success of community college Associate in Arts degree programs. In addition, to describing the demographic characteristics of this population of community college graduates, meaningful information was extracted from the extensive economic dataset by examining the relative value of each of three possible post-graduation paths (FATE #1, FATE #2, and FATE #3) that could have been followed by most of the Associate in Arts graduates. The results of this investigation are presented in essentially the same order as they were collected. The demographic and educational data are presented first. The economic data follow and the results of the employer interviews are presented last.

Demographic Data

Table 4-1 contains a summary of the demographic data. It can be seen from these data that approximately 68% of the total graduating class transferred to one of the

Table 4-1

Demographic Characteristics of the Recovered Sample

	FATE #1	FATE #2	FATE #3	
		Sex		
Male	241	261	338	
Female	358	233	435	
Not Reported	2	0	1	
Total	601	494	774	1869
		Race		
Caucasian	525	431	665	
Black	49	39	47	
Am Indian	2	2	0	
Asian	1	3	8	
Hispanic	20	15	33	
Not Reported	4	4	21	
Total	601	494	774	
		Employment		
Full-time	551	446	684	
Part-time	44	47	44	
More than one job	72	56	46	
Not Reported	6	1	0	
Total	601	494	774	

nine state universities. All three FATE's reflect the trend towards larger numbers of female students who attended community colleges in general during the early 1980's. The only exception was that proportionately more males were in FATE #2 than in FATE #1 or FATE #3. Racially, each of the three FATEs were proportionately very similar in the distribution of individuals within each ethnic group. The only notable feature of these data was the relatively large number of Asian baccalaureate graduates compared to Asian graduates who did not complete their baccalaureate degree program.

Although ages were not available for all graduates, the systematically selected subsamples used for calculating the rate of return, included ages for almost all individuals in each subsample. The distribution of ages within each FATE can be seen in Figure 4-1. Although over 65% of all graduates in each FATE were in the 25-30 year old group, the distributions of graduates' ages were similar for all three FATES. The only notable difference was the relatively higher proportion of older graduates (older than 46 years of age) in FATE #1 than in the other FATEs.

Direct Economic Returns

Rate of Return Calculations

In order to calculate the rate of return it was necessary to segregate individuals within each FATE into age categories and determine the mean income for each

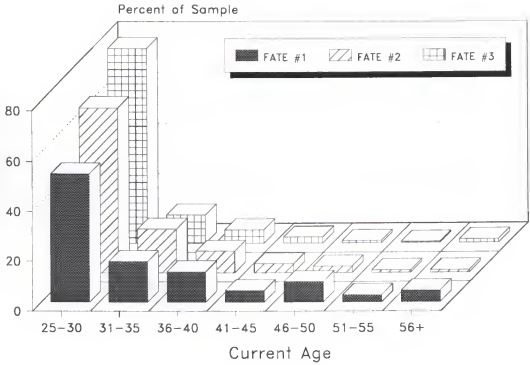

Figure 4-1. Age Distribution in Graduates Used for IRR Calculations.

age group. These values were entered into the following regression model.

$$Y = a + b_1(\text{age}) + b_2(t)^2$$

Where

age = current age
t^2 = years in the workforce squared.

This model is used for smoothing the raw earnings data and is described in Psacharopoulos and Woodhall (1985) as the "elaborate method" of calculating the rate of return. When the predicted mean income values are plotted an age-earnings profile is produced. The age-earnings profile for each FATE is displayed in Figure 4-2. The age-earnings profiles indicate that average incomes are surprisingly similar for the initial years in the job market but diverge in the later

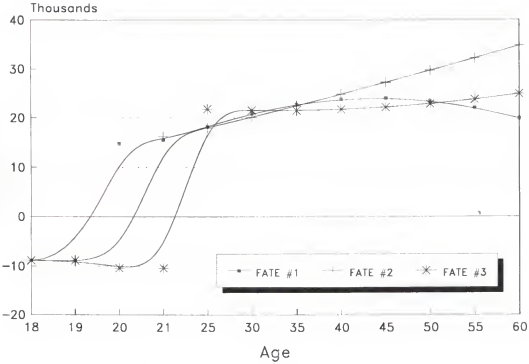

Figure 4-2. Age-Earnings Profiles for All FATEs

years. It should by noted that in FATE #2 the older age categories have very low numbers of individuals. The average income for the age group 46-50 is disproportionately high because there were only three individuals within this category, and two of the three have relative high incomes compared to the mean income for all of FATE #2. The results of the calculations of the differential rates of returns (see Table 4-2). Two different approaches to calculating an rate of return were completed in an attempt to examine more closely the contribution that education alone has on earnings. The alpha coefficient of 0.66 was used in an attempt to correct incomes for individual differences in abilities and more accurately estimate the actual amount of income directly attributed to education as suggested by

Table 4-2

Differential Rates of Return

	FATE #2 / FATE #1	FATE #3 / FATE #1
Regression Model with only Incomes	0.9%	-5.8%
Regression Model with corrected Incomes(alpha=.66)	-0.3%	-6.2%
n = 572		

Blaug (1970). Differential rate of return comparing individuals in FATE #1 and FATE #2 yield an rate of return between 0.9% and -0.3% and the comparison of FATE #1 and FATE #3 yield a rate of return between -5.8% and -6.2%. The negative values indicate that the rates of return to those individuals in FATE #1 was greater that the rate of return to graduates in the other FATE with which the individuals in FATE #1 were being compared.

Income Analyses

Table 4-3 contains a list of the mean annual earnings of all individuals in each FATE as well as the disaggregated mean annual earnings of all individuals in each SIC Division. The results of an analysis of variance for the aggregate means for each FATE indicated that there was a significant difference between FATE's. Posthoc comparisons of the individual pairs of aggregate means using Bonferroni's t yielded a significant t statistic only for the comparison of FATE #2 and FATE #3 (see Table 4-4). The

Table 4-3

Mean Yearly Incomes for Each SIC Major Division

	FATE #1	FATE #2	FATE #3	F = F_{crit}=2.99
Agriculture	$22,024	$16,608	$23,972	
Construct.	$19,512	$19,075	$20,902	0.33
Manufact.	$25,213	$25,759	$26,090	0.08
Transport.	$28,085	$22,519	$23,393	2.41
Wholesale	$25,713	$23,645	$20,737	0.96
Retail	$16,651	$17,993	$22,087	4.27*
Financial Services	$19,786	$20,693	$22,073	0.89
Services	$19,579	$17,764	$21,487	9.91*
Public Adm	$25,315	$21,126	$21,547	4.05**
Total	$21,218	$19,845	$22,173	7.00*
Std. Dev.	$10,565	$10,429	$10,247	

* = sig. dif. (p =.05) FATE #3 > FATE #1
** = sig. dif. (p =.05) FATE #1 > FATE #3

Table 4-4

Bonferonni's t Values for Divisions with Significant Income Differences

	FATE #1/ FATE #2	FATE #1/FATE #3	FATE #2/FATE #3
Aggregate Means	1.34	2.13	6.98*
Retail	0.24	3.93*	2.21
Gen. Services	1.86	3.27*	9.16*
Public Adm.	2.86*	3.00*	0.03

Bonferonni's t_{crit}= 2.43

analysis of variance for each of the SIC Divisions yielded significant F statistics only for the Retail Division, General Service Division, and the Public Administration Division. Further analysis using Bonferroni's t indicated that significant differences existed between the mean annual earnings in FATE #1 and FATE #3 for all three Divisions and a significant difference exists between the mean annual earnings in FATE #2 and FATE #3 for the General Service Division. It should be noted that yearly earnings for individuals in FATE #3 were significantly greater than for individuals in FATE #1 in the Retail Division and the General Service Division, however, the reverse is true for the Public Administration Division where the mean yearly earnings for individuals in FATE #1 was significantly greater than the mean yearly earnings for individuals in FATE #3. All of the remaining five SIC Divisions indicated that there were no significant differences between the mean annual incomes of all three FATEs for each Division. The Agriculture Division was not compared using posthoc treatments due to the low number of individuals in FATE #1 and FATE #3 (see Table 4-5).

Distribution of Graduates within SIC Divisions

Table 4-5 is a contingency table comparing the distribution of individuals within the SIC Divisions for FATE #1 and FATE #3. The significant overall chi square statistic indicated that there was a significant difference in the distribution of individuals within the two FATE's

Table 4-5

Analysis of the Distribution of Individuals Employed in Specific SIC Divisions

SIC Div.	FATE #1 No./ %Row	FATE #3 No./ %Row	Total	Chi-Square per row
Agriculture	4 /33.3%	8 /66.7%	12	0.338
Construction	23 /47.9%	25 /52.1%	48	0.780
Manufacturing	55 /41.7%	77 /58.3%	132	0.000
Transportion	38 /51.4%	36 /48.6%	74	2.896
Wholesale	27 /47.4%	30 /52.6%	57	0.780
Retail	74 /50.0%	75 /50.0%	149	3.989*
Fin Serv	50 /33.8%	98 /66.2%	148	3.722
Service	216 /38.0%	353 /62.0%	569	3.101
Public Adm	55 /48.8%	58 /51.3%	113	2.327
Total	542	760	1302	

Overall Chi-Square = 17.937* (df = 8)

* = significant difference (p=.05)

relative to the total sample. A more detailed examination of the data through the calculation of chi-square statistic for each row indicated that only the distribution within the Retail division was significantly different from the expected distribution.

Table 4-6 lists the distribution of graduates in FATE #1 and FATE #3 in the Major Groups associated with the Retail, General Services and Public Administration SIC Divisions.

Table 4-6

Distribution of Graduates Within the Major Groups Included in the Retail, Service, and Public Administration SIC Divisions.

Division	Major Groups	FATE #1	FATE #3
Retail			
	Building materials, hardware, garden supply, and mobile home dealers	4	5
	General merchandise stores	11	19
	Food stores	15	4
	Automotive dealers and service stations	8	4
	Apparel and accessory stores	4	7
	Home furniture, furnishings, and equipment	8	7
	Eating and drinking places	14	20
	Total	74	75
General Services			
	Hotels and lodging facilities	7	4
	Personal services	0	0
	Business services	26	48
	Automotive repair and parking	5	2
	Misc. repair services	1	1
	Amusement and recreational services	6	6
	Motion pictures	1	1
	Health services	106	65
	Legal services	3	15
	Educational services	39	152
	Social services	10	15
	Museums, art galleries, and botanical gardens	0	1
	Membership organizations	4	2
	Engineering, accounting, research, management, and related services	0	0
	Miscellaneous Services	8	41
	Total	221	356
Public Administration			
	Executive, legislative, and general government	37	24
	Justice, public order, and safety	10	17
	Public finance, taxation, and monetary policy	3	1
	Administration of human resource programs	3	13
	Administration of environmental quality and housing programs	1	2
	Administration of economic programs	1	1
	National security and international affairs	0	0
	Total	55	58

Employer Interviews

The employer interviews were used primarily to determine the potential benefits associated with or the credential value of an Associate in Arts degree in the workplace. The focus of the interviews was on the use of the Associate in Arts degree during the hiring process and after hiring for training or promotion decisions. Each employer was initially contacted by a letter addressed to the Director of Personnel (Appendix A). Following the letter a follow-up phone call was placed to the Director of Personnel or the person who makes the final hiring decisions in the smaller organizations. A general explanation of the project was offered to the employer followed by a request to interview the employer. If an interview was granted, the employer was asked for permission to tape record the interview. Four employers contacted refused to grant an interview. Two other employers were contacted but after arranging a time for a second contact, they avoided the interviewer or blocked the calls on at least three separate occasions. Finally, four employers in the sample could not be contacted because they had no phone number listed in the area code that was supplied by the Department of Labor Statistics Unemployment Compensation Insurance database or the company had gone out of business. This means that twenty-three employers were interviewed or approximately 70% of the original sample. All responses listed are direct quotations from the transcribed tapes of the interviews.

Question 1. Do you have any idea of how many employees in your organization have Associate in Arts degrees?

Yes = 6 No = 15

The vast majority of employers did not know the educational status of their employees. Indeed, they not only did not know, they could not gain access to the information without manually going through the personnel files. Several organizations had employee records in an electronic form, but the information was not readily retrievable. Of the employers who hesitantly ventured an estimate or actually knew how many employees had Associate in Arts degrees, the majority emphatically stated that the number stated was just an estimate, an accurate tabulation would require many man-hours.

Question 2. Does your organization have any positions which specifically require a minimum of an Associate in Arts degree.

There was only one employer who had positions which required an Associate in Arts degree. That employer insisted that one accounting position required an Associate in Arts degree, however, responses to other questions indicated that there was some confusion in the interviewee's mind about the differences between an Associate in Arts and an Associate in Science degree. Many employers do, however, use education as an important component of the hiring decision or allow education to be substituted for experience. Because of this the responses were clustered and coded into the following categories:

	No. of Responses
Absolutely no positions	= 10
An AA used as substitute for experience	= 7
Exerts an influence on hiring	= 5
Associate in Arts required	= 1

The employers that had no positions which required an Associate in Arts degree usually utilized other criteria for making hiring decisions. Such criteria as previous experience and external licensing requirements were used in lieu of education. The following responses characterize these employers.

> It doesn't really matter that much. We are an insurance agency and there are other licenses which are more important than education. You do not need the education to get the licenses. The licensing has been done in several instances through the junior college.

> No, most of the educational requirements state bachelor's degree.

> Some college is more desirable but no position requires the 2-year degree.

Of the employers who stated that education can be substituted for experience, many followed some type of formula whereas others simply counted years of education as substituting for years of experience on a one-to-one basis.

> There are positions which would give you a preference or would give you years off of time in grade if you had an AA degree. For instance, if you had an Associate's degree and you wanted to go from police officer to sergeant, you would have to wait three years to take the test, if not, you would have to wait five years in grade to take the test. In most all positions, the AA degree or two years of college can be substituted for two years of experience. Since most of our promotional opportunities are filled by the use of a written exam, we feel that having two years of college or an AA degree should give them an edge in taking this written exam.

Yes. Most of our screening is done with a combination of education and experience. But there is always a clause that says "or an equivalent combination of education and experience". As I'm sure you know that there are some people with lots of experience but no degree that we don't want to harm by saying you must have a degree. Some jobs have, for instance, a four-year degree and three years of experience, but if you had an AA degree and, say, five years experience we would except that. It also matters who they are competing with or who is in the pool. The police department likes to see their people with an Associate's degree, it is looked upon favorably. A lot of times we will have [on a job description] a high school degree and some specific college coursework. Here's one, it is a fire training officer. They want someone with an AS or an AA degree and some instructional experience. It is my philosophical bend and our director's opinion, that degrees are not as important as experience. For a while there was a lot of emphasis on degrees but there have been a lot of court cases about requiring these degrees so that is why we don't have a hard and fast rule. Some states now are not allowed to even ask for a high school diploma because they can't validate the fact that a high school diploma is needed to do that job.

Off hand I do not. Normally we can use education for experience. Usually, it is four years of college or experience and so many years of experience.

Well normally, we are a manufacturing organization, most of the positions in which we have openings, don't require just an AA degree. We would prefer some college [2 years] to just a high school degree.

Not specifically, their education and experience are measured against specific state [Board of Reagents] requirements for that position. In some cases education can be substituted for experience at the rate of 30 semester hours/year of experience.

To follow up on the second question the third question centered on the specific use of the Associate in Arts degree in hiring decisions.

Question 3. How does your organization use an individual's education, specifically the Associate in Arts degree in hiring decisions?

Some organizations used education as a significant component in a hiring decision and others do not. The organizations that recognize the Associate in Arts degree in hiring decisions were usually relatively large bureaucracies within the public sector. The large bureaucracies typically have stringent guidelines and specific written criteria for each job. The hiring process is also one of distinct steps which must be universally adhered to for all positions and all candidates.

> We use a form devised by the department. We use it to fill each and every vacancy in the _____ department. It is called our Applicant Selection Guide [see Appendix B]. On there, there are five to six categories, and one of these is education. We use this to rank the applicant based on the education they have and how the education relates to the job they are going into. Education is a major criterion we use to rank the applicant.
>
> I would perceive an individual with an AA degree as a better candidate for more potential positions. We have over 450 job titles at _____, the more education an individual has the more of these positions the individual would be qualified to apply for.
>
> It would only be considered a plus if a person had more skills, however, it is not a requirement to have an AA degree. So it would only be looked at during the hiring decision and it would have an additional impact in the interview.
>
> We take a look at that, especially if the degree relates to what they are doing. The AA degree has advantages over the high school diploma in certain areas. When we are looking at child care people, definitely. The more education you have, you are able to deal with kids better [sic]. I would say that it is a definite advantage.

> There is not a requirement beyond a high school diploma or a GED. We use a rating sheet during the oral interview in which differences in education are given a different point value. The categories are: high school, high school and some college, AA degree, BA degree.
>
> Depending on what the focus of the program it could be something that would convince us to hire the person. It also indicates a level of motivation and willingness to commit themselves to an education. This hospital has a very high opinion of people who are willing to dedicate themselves to further education.
>
> Our system is confusing, in personnel it would be a positive stepping stone toward hiring. However, the supervisor ultimately makes the final hiring decision, therefore, it would not necessarily help in hiring. That would depend on their experience and skills as well as their education.

Question 4. How does this organization use an individual's education to determine starting salary?

Once a hiring decision was made, the next potential use of educational credentials was in the determination of the starting salary. Almost all organizations in the private sector did not consider education in salary determinations. It was only an indirect relationship. The vast majority of private organizations had a set salary for each position and only modified this salary for exceptional credentials or several years experience in the same general job field. Public sector organizations restated that generally starting salaries were based on a formula of entry-level salary plus years of experience. Since education in many instances substituted for experience, this would then effect the starting salary. The following is a cross-section of

responses from organizations that modify the starting salary based on experience or education.

> The AA degree is not formally required for any position, however, anyone who is given a position, will have their salary determined by two criteria. First is education, someone with an AA degree will start at a higher salary. The second criterion, is that of experience. Specific salary increments are added for more than the minimum years of experience.
>
> It would only be considered a plus if a person had more skills, however, it is not a requirement to have an AA degree. So it would only be looked at during the hiring decision and it would have an additional impact in the interview. It has no specific impact on starting salary, however it would have an impact due to the "incentive program". Are you aware of the incentive program? Any law enforcement officer [or fire fighter] in the state is eligible to receive an additional $30/month if they have either an AA or AS degree. This is provided under state law, Chapter 943 of the Florida Statutes, and they specifically provide for the salary incentive program.
>
> An individual's education and experience could be a factor in establishing a starting salary. It would be based upon experience. We have different salary grades for different amounts of experience. If an individual had an AA degree, we would consider that the equivalent of 2 years of experience.
>
> Starting salary is based on two things: recruitment difficulty or the person's educational background. There no formulas in use, but two to three years above the job class is needed for an advanced salary above the minimum.
>
> The only extra pay [available at hiring] would be if the person has other specialty training, like EMT training.

The most notable comment was the second comment listed above. The respondent pointed out that, in the public sector, education, specifically an Associate in Arts degree, was recognized as having a positive value for public

employees in the state because the state statute encourages police officers and fire fighters to pursue additional education.

Question 5. Does your organization have any on-the-job training programs?

This question apparently conjured multiple images in the minds of different individuals. Some employers considered the initial job specific training that a new employee receives as on-the-job training. Other employers envisioned any type of seminar, short-course participation, or any type of on-site program as on-the-job training. The responses were clustered into four groups based on the types of on-the-job training that was described.

	No. of Responses
None	= 7
Yes, but as seminars, continuing ed, or short-term courses	= 5
Yes, but limited to entry-level training	= 5
Yes	= 3

Although the majority of employers have some type of self-described on-the-job training program, in most programs education was primarily used to determine who enters a specific program but only through its influence on the initial hiring decision. Once an individual is employed, education is used in the public sector as an initial screening tool, or more frequently job performance and supervisor perceptions were found to be the primary factors determining the availability of advancement opportunities in both the public and private sectors. A cross-section of the interview responses appears below.

Not really, we hire people with these skills already.

Not specifically, usually hands on experience. Each employee goes through an initial employment period of 90 days in which they are evaluated by their supervisor.

It is more personal work characteristics than education that determines promotion and specialized training.

No. We have very specialized employees here, and we talked about licensing a few seconds ago. In addition to that we are very specialized as an insurance agency, and our employees are very experienced in insurance clerical skills which are not learned at the university level but usually with an insurance company or an insurance agency.

Yes, its just working for 3 or 4 weeks with the other people in the office, that is their training.

Yes, we do have some training we put our staff through. [Could you give me some examples?] We do training of people who work with our swim programs, specific to the _____. We train our after school program and summer day camp people, in all areas of those two programs. It really depends on the position they are taking and if there was a need for additional training, the _____ might seek specific training.

Yes, we have our own in-house type of programs. We have our own "destinations" and selling skills programs and an indoctrination program for all new employees, we are such a large company.

There is a state requirement for additional training for police and fire employees. [Does the education influence who receives special training other than police and fire?] No, I doubt it. It is really based more on seniority.

Other than uniformed officers, only for correctional officers and the communication personnel. There is a 20 hour course at _____ Community College. The uniformed officers have a 10 week field training program. In addition, we have special seminars, in-service training and numerous specialized training programs.

Teller training, 2 weeks, customer service training, 2 weeks, consumer loan training 6 weeks, commercial loan training 6 months. Strictly performance based, there are no education requirements.

Yes. [Do any require an AA degree?] No, but it would help in certain positions, like power plant trainee.

Yes, there is are many. The final decision as to who goes on to the on-the-job training program is made by their supervisors.

Question 6. How does your organization encourage employees without a baccalaureate degree to pursue further education?

The most remarkable feature of the responses to this question was that only one organization, a small business owner, absolutely did not make any provisions for employees to further their education. All of the remaining respondents indicated some type of encouragement including the cluster called "lip service." This cluster was composed of two employers who stated that it was certainly a good idea for the employee to pursue further education, and it would be looked upon favorably, however, it must be on the employee's own time. In other cases opportunities were available for specific types of employees and not for others. In particular, hospitals encourage employees to become nurses but are less encouraging for other workers and other goals. In addition, a county school board reimbursed teaching employees for their educational expenses but not non-teaching employees. Other than in these few instances, all other employers had some type of established policy or assistance program for employees seeking to further their

education. In several cases, specific rewards were provided by the employer through direct salary increases or an increased availability of advancement opportunities following the completion of additional education. Prompts concerning the availability of tuition reimbursement, book reimbursement, and special considerations for scheduling around classes were frequently used to supplement the initial question. A representative group of responses follows.

> Sure, we encourage our employees but its only in the sense that there is no tuition reimbursement program in place currently. It is funded by the county board of commissioners and it has not been funded for seven or eight years. I can't really say if scheduling or any other special considerations are provided because we are on 12 hour shifts. [Three 12 hour shifts one week, and four 12 hour shifts the next] With 12 hour shifts each week the officers work different sets of days, therefore, it is impossible to have the same days off each week.
>
> I hire a lot of students, and I try to work with them to give them time to attend college. [Do you offer tuition reimbursement?] No.
>
> We would accommodate somebody if they were pursuing an education which would directly benefit
>
> us. We would be less willing to do this with a course that doesn't directly relate to us.
>
> We offer a tuition reimbursement program. It is a specific amount and they get reimbursed if they take specific courses and if they are related to their work.
>
> Yes, most definitely. We have a very good tuition reimbursement program. We have about 250 employees receiving tuition reimbursements. A large number of them are taking courses at the Associate degree level the next greatest percentage at the baccalaureate and fewer yet at the master degree level. You have to have worked for _____ at least 6 months as a regular

employee. Then you are eligible for tuition reimbursement. If you are a full time employee you are eligible for up to $1000 per year, and if you want to become a registered nurse you are eligible for up to $2000 per year. We will cover the costs of tuition, books, lab and library fees. If you are a part-time employee is eligible for up to $500 per year or $1500 for a nursing program.

Yes we do, we have a tuition reimbursement program. It is up to $500 each year, and the courses must be job related and they must make at least a "C". It is for just tuition.

We have educational programs for our employees. If the courses are directly related to their jobs or the courses are leading to a degree, we will reimburse. [Any type of degree, even an AA?] Yes, any educational type of program. Tuition and books, the student has to lay out the money initially, and when they have completed the course, they have to present us with a certificate or their grades and then that is processed through, and they will be reimbursed.

We do have a tuition reimbursement for employees. You have to be a city employee for one year and have permanent status. You can take two courses per semester. If you receive a grade of C or better, the city will reimburse you for your tuition. The type of schooling is not limited, even Law or Master's degree training is possible.

Well we have two things we do. We take advantage of the six credit hours free tuition credit at the state universities. And _____ has a special program which begins after the AA degree in the junior year. We will approve a year's leave of absence with pay and maybe for even a senior year, especially in areas where _____ needs specific expertise. These areas would be Real Estate, Engineering, Data processing and maybe even accounting. So we will pay the employee full salary, but the employee will have to pay their own tuition. I think that is a unique program. [This is a state agency]

Question 7. What skills and abilities do you perceive that an individual with an Associate in Arts degree brings into the workplace?

As would be expected, responses to such an open-ended question fell into a wide variety of clusters. Individual

Responses	Cluster	Group
5	Communication	Academic Skills = 7
2	Math skills	
4	Higher motivation, Accomplishment	Maturity= 13 Factors
1	Thinking processes, Maturity	
3	Organizational processes	
5	Ability to learn	
2	No difference	
1	Did not know	

Figure 4-3. Clusters and Groups used to Analyze Responses to Question #8.

clusters used for analysis and the number of responses in each cluster can be found in Figure 4-3. The clusters of responses which attempted to distinguish between a high school graduate and a Associate in Arts degree graduate also could be aggregated into larger groupings. These larger categories reflected a concentration primarily on increased academic skills or increased maturity factors. The academic skills were principally communication skills such as writing, speaking, or listening skills, specifically, following instructions. Several employers mentioned improved math skills. They cited examples of primarily computational skills with little emphasis on higher level skills such as algebra.

The maturity factors were a more diffuse aggregation of clusters. Many employers mentioned or eluded to specific individual personality characteristics which could be associated with maturity gained only though experiential learning. Some employers actually used the phrase "more

mature" or "greater maturity." Others only suggested actions which could be used to characterize a mature individual. Examples of such actions would be someone who was highly motivated, had good organizational skills, were goal-oriented, or had a demonstrated commitment to learning and could learn new tasks readily. Only two employers could not identify any characteristics of Associate in Arts graduates that would separate them from a high school graduate. One employer could not answer any way other than "I don't know, I really just couldn't say." A representative selection of responses appears below and is aggregated by group.

Academic Skills

> Specific skills? I do follow education enough to know that they are emphasizing writing skills. They think that the two years they spend in Jr. College certainly teaches them to communicate a lot better.
>
> Well, unfortunately the high school diploma doesn't tell us what it used to tell us. You could depend on good reading, & writing skills, basic good English, basic math, and an understanding basic scientific principles. We are finding that these just aren't there with most high school graduates.
>
> Primarily we see a difference in their communication skills. Over the last three years I have noticed that many of the applicants with AA or AS degrees will type their employment applications. Their writing is clear and concise. A second thing that I have noticed is that they seem to be much more mature and more highly motivated. It is rare that I encounter an individual with an Associate degree who is planning to stop there. Their motivation and drive is much higher and this translates into the job.

Their report writing skills might be a "tad" better.

Specific skills which are most evident are the writing skills, but they also demonstrate that they are not afraid of mathematics or new training on machinery or computers. We even have set up special programs for our employees at _____ CC to train them to use computers.

On a personal basis I feel that the person is the type to go the extra mile. It spills over into other things like writing ability, etc.

Maturity Factors

I guess the fact that someone went on to work for another two years to continue their education, it would just weigh a little heavier with me. The fact that they got a degree I would feel comfortable that they were a type of person who would stick with something and have some interest in furthering their education. Not just doing the bare minimum that is required, just a high school diploma.

They typically have better organizational skills, research skills, prioritizing and they develop better interpersonal skills which normally are not received in a routine work setting. It just demonstrates a commitment to academic learning.

As an individual, I would look at education, life and work experiences to consider the total person. For someone younger, who hasn't had any life or work experiences schooling would help with organizational skills and those kinds of things.

As far as skills they would be about the same, but they might be more mature about what they do. They would be able to think better, clear and be able to understand things. Where somebody who had just high school might not have the maturity to deal with the public and handle the problems that might arise.

They are much more sophisticated in their thought processes. They are far more mature, not just young people, it is the maturity of thought.

Well I think that it is organization. So many of the kids now work and go to school, so they have

to learn how to prioritize, gain time management and organizational skills. Also they are learning communication skills.

They would be more well-rounded. More confident, more self-assured, more capable of learning new procedures.

Education is Unimportant to Employment

In our field, it really doesn't matter if they have an Associate in Arts degree, so we don't pay any attention to it.

No, because they would be looking at who had the greater experience.

Question 8. If an individual is hired with a high school diploma and while employed by your organization they complete their Associate in Arts degree, would they automatically get a raise or any other consideration as a result of graduation?

The responses were disproportionately weighted (16/23) in favor of little or no consideration provided to graduates. Indeed many of the employers stressed that job performance and supervisor perceptions were much more important than education once an individual has been hired. Among the employers who do reward graduates, one organization offers employees a specific raise for completing an Associate in Arts degree. Others cite that a greater array of potential positions are available due to a change in the individual's educational accomplishments.

There are no jobs which require an AA degree specifically, however, we encourage our employees to pursue additional education beyond the high school degree. We even give them a raise when they complete an AA or AS degree. [How much?] 5.9%

No. [Are any new opportunities available?] Yes, I would say often it does. [Could you give an example?] In the clerical field if we have a

person who is at staff assistant II, if they got their degree, it would be easier for them to get a promotion to an administrative assistant, the next highest position. That is not to say that they couldn't do that without a degree, but it would look good.

No. We don't increase salary for education. Then they would be eligible to apply for a position for which that might be a requirement.

Not within the same job class, the only recognition is that they are now qualified for more [job] titles. There is no incentive program or award that will increase the salary simply because of the completion of the AA degree. It opens more "doors" but it does nothing in your current class.

No. The more education you have the better off you are. In general, it works in the employee's favor if someone sees that you are trying to better yourself. Many other things go into the decision such as performance, however, the education is a plus.

Not initially, or on a formula basis. This is an indication that they are motivated to move up. And we will move a person as fast as their ability shows that they can handle it. I want to say that the only limitation will be self held. The further they move up along the advancement ladder, the more their education will help them.

Analysis of Amount of Time Employed

The time employed within each FATE was used as a measure of one facet of the spill-over benefits to society of an employed work force. A 3X1 ANOVA comparing the mean number of weeks worked by each set of graduates over a five quarter period and for a standardized year were prepared. Both part-time and full-time workers were included. Graduates who had more than one job per quarter had the weeks worked on the second job included in the total weeks worked. The total number of weeks worked were compared and

Table 4-7

Comparison of Mean Number of Weeks Worked by Each FATE

	Weeks Worked During Five Quarters	Weeks Worked During Standardized Year
FATE #1	54.10	46.92
FATE #2	54.32	47.09
FATE #3	52.92	47.48
	F = 0.696	F = 0.257
	df=2,1782	F_{crit}=2.99

the results appear in Table 4-7. In order to standardize for individuals who worked for less than all five quarters, the total number of weeks worked by each graduate was calculated as a quarterly average and this quarterly average was extrapolated into a standardized yearly total. The comparison of the standardized yearly mean number of weeks employed by each FATE can be found in Table 4-7. There were no significant differences found among the mean number of weeks employed in both determinations.

CHAPTER V
DISCUSSION

Introduction

Weisbrod (1964) established a framework within which the benefits of acquiring differing levels of education could be analyzed. Weisbrod viewed a benefit as "anything that pushes outward the utility possibility function for the society" (p. 17). The "utility possibility function" can be further segregated into two distinct categories. First, the benefits realized by the student and, secondly, the benefits available to society in general. The benefits to the student are principally (a) a direct financial return which accompanies additional education, (b) a financial option return which is a value associated with the opportunity to obtain still further education, (c) opportunity options which are a non-monetary broadening of individual employment choices which education permits, and (d) a hedge against the technological displacement of skills. The benefits to the society in general consist primarily of anything which (a) increases production possibilities, for example labor productivity, (b) reduces the need to incur costs such as law enforcement, thus releasing public funds for alternative uses; and (c) increases welfare possibilities directly, such

as development of public-spiritedness or increasing the social consciousness of one's neighbor. This study was designed to evaluate the relative value of an Associate in Arts degree to graduates who did not pursue further education (FATE #1) in light of Weisbrod's proposed benefits of additional education. Within Weisbrod's propositions is the underlying assumption that additional education will allow an individual and society to reap additional benefits. If groups of individuals with differing levels of education are compared, the benefits received by each group should differ in a direct relationship with the total amount of education completed. These differences should be reflected in an increase in total annual earnings, the available educational options, the available opportunity options, and the available training options as well as an increase in the social value of additional education thorough an increase in labor productivity, a reduced need to incur costs and an increase in the general community welfare.

Overview

This analysis focuses on the individuals within FATE #1 and the value, both economic and perceived, of the Associate in Arts degree in within the context of Weisbrod's potential benefits. From the employer interviews it was apparent that the degree potentially was valuable at two distinct points in an individual's career. The first point a graduate could receive value from the use of the degree would be during the initial hiring process. It could be used as a credential

that opens access to a specific array of potential positions. The second use of the degree would follow the initial hiring decision. This second use would be to aid the graduate in gaining access to additional training or advancing to a position of greater responsibility. Both potential uses would fall within the range of the Opportunity and Financial Options that were outlined by Weisbrod. It was assumed that positions of increased responsibility would remunerate the graduate at an increased level thus increasing both productivity and the direct financial return simultaneously.

Two caveats are proffered prior to the discussion of the data. It should be remembered that the data have been collected only eight years following graduation with an Associate in Arts degree. The results of this study could be very different if these individuals were examined again at 15 or 20 years following graduation instead of only eight years after graduation. The second caveat is that this data set is limited to only community college graduates, when the term "baccalaureate degree graduate" is used, it is meant to describe only that component of the sample who have completed a baccalaureate degree (FATE #3). The results of this study should not be extrapolated to all baccalaureate degree graduates.

Direct Benefits to the Student

Direct Financial Returns.

The direct financial returns to the graduates were measured by examining the rate of return on the investment in education and also comparing the 1987-88 mean annual earnings of graduates within all three FATEs. These measures would answer research questions #1 and #2.

> Question #1. Does the private rate of return on an investment in education for an individual with only an Associate in Arts degree compare favorably to the rates of return for individuals who secure additional education.

The negative rate of return when comparing the graduates in FATE #3 and FATE #1 (-5.8% with no correction and -6.2% using the alpha coefficient) was surprising but not completely unexpected. Almost all other studies which calculated rates of return on the value of a baccalaureate degree as compared to a high school diploma indicated that the results usually were in the range of 8% to 18% (see Table 2-4). Blair, Finn, and Stevenson (1981) examined the earnings of Associate in Science degree graduates after 10 years, 20 years, and 35 years following graduation. Their results indicated that the Associate in Science degree graduates experienced a rate of return of 8.2% to 14.9% with the rates of return going up over time. The presence of the negative value for the rate of return in this study was an indication that FATE #1 had a greater return on the graduate's investments in education than the individuals within FATE #3. Even when the rate of return was calculated

using the alpha coefficient of 0.66, the rate of return was -6.2%. This negative rate of return could very well be a reflection of the relatively long period, approximately eight years, that the graduates in FATE #1 have been in the employment market as contrasted to the three to four years that the individuals in FATE #3 have been in the job market. Judd (1988), using the same data set, found that the majority of Associate in Arts degree graduates in FATE #3 graduated with their baccalaureate degree between 1982 and 1984. This would mean that these graduates would have been in the job market for a much shorter period of time than the graduates in FATE #1. In addition, an equally plausible explanation would be that the graduates in FATE #3 have been burdened by an additional two years of costs at a university. The difference in initial costs should be made up by the deferred earnings that would be received by individuals in FATE #3. It is quite possible that these deferred earnings have not yet exerted a significant influence on the rate of return. In another five or ten years the relative rates of return could be very different than they were in this analysis.

The rates of return have been primarily used in studies designed to be cost-benefit analyses (see Table 2-4). These studies frequently compared investments in education with alternative investments. Although this use of the rate of return on investments completely ignored any type of nonpecuniary value offered by investments in education, it

is still a useful measure of the return to the investor on investments in education. Leslie and Brinkman (1986) pointed out that "most analysts select a 10% social and private IRR as suitable for the degree of risk represented by investment in education" (p. 210). If this value is used to compare an investment for individuals in FATE #1 with investments made by graduates in FATE #2 and FATE #3, neither IRR value calculated would seem to offer a substantially greater return on an investment in education than on comparable alternative investments. Fortunately this is not the only standard used to judge the direct financial return of an Associate in Arts degree to those graduates within the sample being evaluated.

> Question #2. Do the annual incomes of Associate in Arts degree graduates who do not transfer to the university differ significantly from the annual incomes of Associate in Arts degree graduates who pursue further education when the graduates are employed in the same general business field?

The second measure of the direct financial return to Associate in Arts degree graduates was a direct comparison of the aggregate mean incomes for all individuals in all three FATES. In addition to the aggregate mean yearly incomes of Associate in Arts degree graduates, a disaggregated comparison was also made using the Divisions defined within the Standard Industrial Classification code used by the U.S. Office of Management and Budget. Table 4-3 contains a summary of the analysis of the mean annual earnings of graduates in all three FATEs in eight of the

nine SIC divisions. As important as the significant values are within the confines of the study, it should also be pointed out that the nonsignificant values stand out as being extremely valuable in the total evaluation of the data. It should be noted that even though there was a significant difference between the aggregate mean annual earnings for graduates in all three divisions, subsequent posthoc tests indicate that the reason for the significant difference between the aggregate means is not a difference between FATE #1 and FATE #3 as would be predicted by Weisbrod, but the significantly different value was the comparison of mean annual earnings for FATE #2 and FATE #3. The mean annual earnings for FATE #2 was significantly lower than FATE #3 but not FATE #1. This finding would indirectly support the rate of return values because if there was no difference between the mean annual earnings for FATE #1 and FATE #3, then the additional costs of the upper-division university work would overwhelm any potential additional earnings derived by members of FATE #3 when they were employed at higher initial salaries but several years after the graduates in FATE #1 entered the job market. These data suggest that the lack of significance between the salaries of individuals in FATE #1 and FATE #3 indicates that there was little, if any, initial financial advantage to the graduates in FATE #3 for pursuing additional education when being compared to graduates in FATE #1 who have been working, gaining experience, and job specific skills which

were rewarded with incremental salary increases while the individuals in FATE #3 were still pursuing additional schooling.

By disaggregating the earnings into the separate SIC divisions and comparing the mean annual earnings of individuals in all three FATEs it was possible to further isolate the differential earnings in an attempt to define which specific job categories were most favorable to the individuals in all three FATEs. There were no significant differences found between the three FATEs in five of the eight SIC divisions. No statistically significant differences were observed between the three FATEs in the Construction, Manufacturing, Transportation, Wholesale and Financial Services divisions. Within the Retail and General Services divisions there were significant differences between the individuals in all three FATEs. Further analysis using Bonferroni's t statistic indicates that significant differences existed only between FATE #1 and FATE #3 in the Retail division and significant differences existed between FATE #3 and FATE #1 as well as between FATE #3 and FATE #2 in the General Services division. In the Public Administration Division a significant difference existed between FATE #1 and FATE #3, however, the difference was in favor of the individuals in FATE #1. This relationship between FATE #1 and FATE #3 was contrary to existing theory. The major groups associated with the

Retail, General Service and Public Administration Divisions are listed in Table 4-7.

A further investigation of the distribution of graduates within each of the major groups in each SIC division in which there was a significant difference between the mean annual earnings in FATE #1 and FATE #3 revealed that the majority of graduates were in only two or three of the major groups within the General Services and Public Administration Divisions. This would be a reflection of the job opportunities available in the local employment markets. In the General Services division over two-thirds of the graduates employed in this division were employed in the Health Services, Educational Services, Legal Services and Social Services. These four areas would place a hiring emphasis on not only entry-level employees with a baccalaureate degree but also many would encourage post-graduate credentials from employees. It was not surprising, therefore, to find that the mean annual earnings of the graduates in FATE #3 exceeded that of graduates in FATE #1.

In the Retail division there was a relatively even distribution of graduates within six of the eight Major Groups within this division. The interview process revealed that most employers in the private sector have minimum educational requirements for most entry-level management positions as either a baccalaureate degree or, in a few cases, they required "some college" and a specific number of

years of experience in that business field. Therefore, it is highly probable that within the Retail division, individuals applying for entry-level management positions are screened by the preferential hiring of baccalaureate degree graduates in these higher paying entry-level positions. Again, the Retail and General Services divisions conform closely to generally accepted maxim within human capital theory literature that there is a direct relationship between investments in human capital in the form of education, and the returns to the individual in the form of income opportunities and advancement potential.

In the Public Administration Division the relationship between education and income was distinctly different. Within this division the vast majority of graduates were concentrated within the General Government (local, county and state) and in the Justice major groups. These include civil servants at all levels of the government and in particular police and fire employees. Out of the 23 employers contacted during the interview process five of the graduates were employed with municipal police or fire departments or for state agencies. From the employer interviews it was found that an Associate in Arts degree was recognized and included as a significant component of the initial hiring decision, especially of youthful applicants with little work experience. In addition, the Associate in Arts degree (or an Associate in Science degree) provides, under Florida Statute 943.22, an additional salary incentive

which is added monthly to the earnings of police or fire employees who have completed this level of education. This same state statute also provides for an additional monies to all police and fire employees who complete a baccalaureate degree. Interviewees all agreed that, by far, the most common credential among "uniformed personnel" was an associate degree. None of the interviewees knew how many individuals in their employ had each type of associate degree. This salary incentive, however, does not fully account for the $3768 difference in mean annual earnings that were observed between the individuals in FATE #1 and FATE #3. This additional salary differential could be accounted for by the additional incremental wage increases the individuals in FATE #1 accrued during the 3-4 years individuals in FATE #3 were making additional investments in education. Another influencing factor could also be an ancillary benefit from entering the work force earlier, that is, taking advancement tests earlier than the individuals in FATE #3. One employer stated during the interview

> There are positions which would give you a preference or would give you years off of time in grade if you had an AA degree. For instance, if you had an associate's degree and you wanted to go from police officer to sergeant, you would have to wait three years to take the test, if not, you would have to wait five years in grade to take the test. In most all positions, the AA degree or two years of college can be substituted for two years of experience. Since most of our promotional opportunities are filled by the use of a written exam, we feel that having two years of college or an AA degree should give them an edge in taking this written exam.

If this type of advancement policy is relatively widespread

in local police and fire departments, and certainly some type of objective evaluation is common within most components of the public sector (see Applicant Selection Guide, Appendix B), then individuals in FATE #1 not only were gaining income by incremental raises, but also they had an advantage over FATE #3 graduates by qualifying to compete for advancement opportunities earlier. The combination of these two factors could account for a significant difference between the mean annual earnings of individuals in FATE #3 and FATE #1 within the Public Administration Division.

In summary, it would appear that eight years after graduation, the direct financial returns for individuals within FATE #1 and FATE #3 were overall remarkably similar. This assertion was supported by the relatively low and negative rate of return on the investment made in education. The lack of significant differences between the aggregate mean annual earnings of graduates in FATE #1 and FATE #3 and the lack of significant differences between the disaggregated mean annual earnings of graduates in five of the eight SIC divisions also lends credence to the assertion that the direct financial returns are not significantly different in the public sector and a majority of other SIC divisions.

These findings also point out that in specific portions of the job market, such as the General Services and the Retail Divisions, additional investments in education can reap additional direct financial returns which are

significantly different from individuals with less invested in education. In contrast to these divisions is the Public Administration division, in which individuals with less invested in education had significantly greater mean annual earnings than did individuals in FATE #3. The differences in the Public Administration Division would seem to be closely related to the relatively objective and seniority oriented, hiring and promotion practices which are mandated within large segments of the Public Sector.

Financial Option Returns

The financial option returns as defined by Weisbrod (1964) includes the opportunity to obtain still further education or on-the-job training and the rewards which accompany any addition to an individual's reservoir of human capital. In lieu of attempting to quantify these options, a qualitative assessment was used to determine the extent of the availability of employer supported programs which were designed to encourage employees to pursue further education. All employers but one, in responding to Question #6 on the Employer Interview, indicated that there was some type of formal or informal policy which assists employees who want to pursue additional education. The type of benefit available and the restrictions or limitations placed on the benefits varied dramatically from employer to employer, however, almost all employers agreed that additional education beyond high school would be viewed positively and course work which is relevant to the individual's specific

job or even course work that is peripherally related to the business would be more readily encouraged than non-business related course work. As an example almost all hospitals had specially funded programs available to employees which not only encourage employees to pursue further education, but for employees interested in the nursing profession, an area of critical need, most of these policies were extremely liberal. Almost all hospitals had programs designed to encourage employees to go into nursing or some type of health-related degree program, however, the same liberal options would not necessarily be offered to a business office employee wanting to pursue a business degree. These educational programs would have to be examined and evaluated on a case by case basis before support was offered.

> Yes, most definitely. We have a very good tuition reimbursement program. We have about 250 employees receiving tuition reimbursements. A large number of them are taking courses at the associate degree level the next greatest percentage at the baccalaureate and fewer yet at the master degree level. You have to have worked for _____ at least 6 months as a regular employee. Then you are eligible for tuition reimbursement. If you are a full time employee you are eligible for up to $1000 per year, and if you want to become a registered nurse you are eligible for up to $2000 per year. We will cover the costs of tuition, books, lab and library fees. If you are a part-time employee is eligible for up to $500 per year or $1500 for a nursing program.

The public sector employers, with one exception, were very liberal in the course work supported by their educational plan. All encouraged coursework leading to a baccalaureate degree and many even encouraged post-

baccalaureate work. All state employees are allowed, by state statute, to take six credit hours of course work at any state funded college or university without charge. In addition, one state agency even provides for paid educational leave for employees pursuing specific degree programs.

> Well we have two things we do. We take advantage of the six credit hours free tuition credit at the state universities. And _____ has a special program which begins after the AA degree in the junior year. We will approve a year's leave of absence with pay and maybe for even a senior year, especially in areas where _____ needs specific expertise. These areas would be Real Estate, Engineering, Data processing and maybe even accounting. So we will pay the employee full salary, but the employee will have to pay their own tuition. I think that this is a unique program.

Although many employers would assist employees to pursue specific job-related academic programs, it was clear from the responses that the while most employers encourage employees to pursue an associate degree or a baccalaureate degree, many employers were hesitant to fund post-baccalaureate programs except where the benefits would directly profit the employer as well as the graduate. One public sector employer expressed reservations about funding graduate level courses. The general feeling was that since the public sector pays so much less than the private sector, anyone pursuing advanced degrees would leave the public sector for a better paying job after the public sector employer helped pay for the education. The employer interviewed explained that this was currently a very sensitive issue because the employer had just had several

employees do this recently. Because of the hesitancy to fund advanced training and because many employers, such as hospitals, want employees to gain job-related skills which are available at either local community colleges or state universities at the associate and baccalaureate level, individuals with less than a baccalaureate degree find an extremely fertile environment for taking advantage of the available educational benefits offered by employers. Weisbrod (1964) stated that the value of a financial option for additional education or training is the product of the probability of exercising the option and the expected value if the option is exercised. With this relationship in mind, it would appear from the limited data collected, individuals with less than a baccalaureate degree have a much greater potential for exercising the option (as evidenced by more individuals being funded at this level), even though the expected returns would be less than those expected for a baccalaureate graduate pursuing advanced training. Even if the rewards were less, the greater potential for exercising the option would offset any additional financial advantage to graduates in FATE #3 and would provide graduates in FATE #1 and FATE #2 with a greater financial option return than graduates in FATE #3 who would have a much lower probability for exercising the education option. This was best exemplified by the program for a paid two year educational leave that was available to associate degree graduates and

would not have been available to individuals in FATE #3 employed by the same state agency.

Opportunity Option Returns

Opportunity option returns were described by Weisbrod (1964) as providing a broadening of the nonmonetary individual employment options "the value of education is a function of the additional options which become available after having it--job options and income-leisure-security options" (p. 22). If there were differences in the potential array of job options that are available to individuals with different levels of education, then there should be a difference in the distribution of graduates within the nine SIC Divisions.

> Question #3. Do Associate in Arts graduates who do not transfer to a university have available a different array of potential employment opportunities than graduates who pursue additional education?

Table 4-5 contains a contingency table which compares the distribution of individuals within FATE #1 and FATE #3 within all nine SIC divisions. The Chi-square value of 17.937 indicates that there was a significant difference in the distribution of graduates within the SIC divisions. Subsequent chi square statistics comparing the numbers of individuals in each FATE with the number of individuals that would be expected based on the total size of each FATE, indicated that it was only within the Retail Division was there any significant difference in distribution.

The Retail Division is composed of retail merchants, large corporations and small entrepreneurial enterprises. The merchants and retailers, whether groceries, restaurants, or a major discount department store, will place a different value on education beyond high school than service or government organizations such as a hospitals, police departments or state agencies. Most of the responses by employers with organizations in the Retail division viewed education as having only limited value at best. The skills they needed from their employees were not of a type that could be gained in an educational setting. If education is viewed as being not really essential and the few individuals in FATE #3 who were hired would go into management, employees from FATE #1 would be relegated to the myriad of minimum wage or low paying entry-level clerical and sales positions which historically are seasonal and experience a high level of turnover.

> There is no job at our stores which requires any type of college education nor do they even require a high school education. Not to say that it [post-secondary education] wouldn't be of a great help to a person. [Convenience Store]

> Anyone with formal education would excel over folks with just a high school education, from doing calculations to just staying on top of things. However, there are a number of talented individuals with us who have only a high school education but have been in the industry for a number of years and just based on on-the-job experience have done very, very well. [Grocery chain]

The nonsignificant differences in the number of individuals in all eight other SIC Divisions strongly suggest that

graduates in FATE #1 have an equivalent array of opportunities available to them as do individuals in FATE #3. Even though the type of opportunities would vary due to different entry-level education requirements, the number and variety of potential positions are relatively uniform and proportional across different levels of educational achievement.

Completing an Associate in Arts degree while employed does little immediate financial good for a graduate within the organizations contacted. Only a few employers noted that there was an immediate increase in salary with completion of an Associate in Arts degree, and this was due to statutory requirements more often than employer policy. A point that many employers, especially public sector employers, made repeatedly was that anyone who completes an Associate in Arts degree would then open up a new array of potential jobs for which they were now qualified.

> No. [Are any new opportunities available?] Yes, I would say often it does. [Could you give an example?] In the clerical field if we have a person who is at staff assistant II, if they got their degree, it would be easier for them to get a promotion to an administrative assistant, the next highest position. That is not to say that they couldn't do that without a degree, but it would look good.

> Not within the same job class, the only recognition is that they are now qualified for more [job] titles. There is no incentive program or award that will increase the salary simply because of the completion of the AA degree. It opens more "doors" but it does nothing in your current class.

Within the highly structured bureaucratic hierarchy, all positions are carefully defined and specific qualifications are usually assigned based on a variety of internal criteria. When an employee improves their educational credentials and combines these with the accrued experience and work record gained during the time they have been employed, these combine to increase the array of potential internal advancement opportunities available to the Associate in Arts degree graduate.

A Hedge Against Technological Displacement of Skills

Of all the aspects of Weisbrod's direct benefits of education accumulated by a student this was by far the most difficult to evaluate.

> Question #4. Do the employers of nontransferring Associate in Arts degree graduates perceive that the experiences or skills gained as a result of additional education serve as a hedge against technological change by enhancing an employee's willingness or ability to learn new skills.

The results of the employer responses were extremely varied and diverse in describing the skills that an Associate in Arts degree graduate would bring into the job market. It was possible, however, to aggregate the responses into the two broad categories of academic skills and maturity factors (see Figure 4-3).

The employers interviewed frequently mentioned specific academic skills as being beneficial, specifically communication skills such as writing, grammar, and listening skills. Only two employers mentioned specific mathematics

skills and these skills were at a low order of proficiency, and were basically computational speed and accuracy which were of concern.

The perceptions clustered within the category maturity factors were combined because the comments made by the employers indicated that job performance, organizational skills or maturity factors such as ability to deal with the public, interpersonal skills, ability to prioritize tasks, a commitment to completion of a task (the degree), and an emotional and behavioral sophistication, were the dominant skills Associate in Arts graduates brought into a new job. Many employers also stated that the absolute age of the individual was not an real factor in the maturity of the individual, it was the behaviors which reflected the maturity, not the age.

Hazler and Latto (1987) surveyed 46 employers of high school graduates which represented over 6,300 entry-level jobs. The employers interviewed in this recent study indicated that the following skills were needed in their entry-level employees:

1. following spoken instructions,
2. reading and understanding what has been read,
3. following written instructions,
4. speaking and listening and,
5. thinking and solving problems (p. 132).

Because these primary skills which employers of high school graduates hold in high regard are similar to the skills

perceived as being present in greater quantity in Associate in Arts degree graduates by their employers, then the Associate in Arts degree would most assuredly be viewed by employers as a definite plus. This was definitely the case in the interviews. Over 75% of all of the FATE #1 employers stated that having an Associate in Arts degree was a distinctly positive factor at the time of hiring. It must be stressed at this juncture that employers also emphasized that hiring decisions were not restricted to just these perceptions. Other factors such as previous experience, employer references, comparisons to other applicants and the personal interview weigh heavily in the final hiring decision.

The Applicant Selection Guide (Appendix B) also highlights the value of the very same skills cited by both the employers interviewed in this study and the employers in the Hazler and Latto (1987) study. The ratings categories of communication skills, motivation and interest in position, ability to accomplish assignments, planning and organizational abilities along with education are the dominant categories in terms of the total rating value computed from the selection guide. All of the desired characteristics assessed on the Applicant Selection Guide reflect the same type of Maturity Factors that were cited by the employers interviewed, as being present in greater quantities in Associate in Arts degree graduates.

The high degree of correlation between the skills or characteristics perceived as being highly desirable in an employee by the three sets of employers would strongly suggest that there are a set of skills, highly variable, yet still present in Associate in Arts degree graduates which provide them an edge over high school graduates in hiring decisions. These skills also allow the Associate in Arts degree graduate greater flexibility to be trained, greater intellectual dexterity and sophistication of thought so as to allow them to learn new skills with greater alacrity than a high school graduate. Several employers stated it directly.

> Specific skills which are most evident are the writing skills, but they also demonstrate that they are not afraid of mathematics or new training on machinery or computers. We even have set up special programs for our employees at _____ CC to train them to use computers.

> They typically have better organizational skills, research skills, prioritizing and they develop better interpersonal skills which normally are not received in a routine work setting. It just demonstrates a commitment to academic learning.

> As far as skills they would be about the same, but they might be more mature about what they do. They would be able to think better and be able to understand things. Where somebody who had just high school diploma might not have the maturity to deal with the public and handle the problems that might arise.

> They are much more sophisticated in their thought processes. They are far more mature, not just young people, it is the maturity of thought.

> They would be more well-rounded, more confident, more self-assured, more capable of learning new procedures.

The Maturity Factors which are recognized in the preceding responses illustrate that education does imbue most individuals with some characteristics that are perceived to be desirable by employers. It must be pointed out that simply aging and the accumulation of experiences which occur in day to day living and are not related to the classroom experiences, must also color the maturational processes which occurs within an individual. Yet it must also be recognized the independent learning that invariably occurs within the environment of higher education is certainly not the same academic pressures that is exerted within most high school programs. It does require a degree of sophistication and maturity just to get though the maze of requirements placed on the student during their progress towards an Associate in Arts degree.

Direct Social Benefits

Of the four direct social benefits described by Weisbrod (1964), only three--increased production possibilities, increased tax base, and a reduced need to incur costs--can be approximated using this data set. Even so, the tool used to estimate all three benefits was the same unit of measure. Individuals who are active in the labor market, generally, are less likely to be a drain on public funds by requiring unemployment compensation, welfare, Aid to Dependent Children or any number of other widely available social programs designed to aid individuals with little or no income. Ashenfelter and Ham (1979)

proposed, based on a sample of 779 U.S. white males, that a direct relationship between schooling and unemployment existed, "schooling produces this effect on unemployment solely by reducing the incidence of unemployment spells among the workers in our sample" (p. S114). Ashenfelter and Ham (1979) concluded

> We also find that a considerable fraction of the measured unemployment hours behaves as if it was primarily a part of the offer to sell labor and does, therefore, represent real constraints on choice. It follows that educational investments do relax the constraints on choice that workers face in the labor market, but whether these are merely private or also social gains cannot be determined without further research. (p. S115)

Nickell (1979) working with a British dataset (n=6900) concluded that "increases in the level of an individual's education up to but not beyond the university entrance lead to strong reductions in the number of unemployment spells which he can expect to experience over his lifetime" (p. S129).

The data available from the dataset were in the form of the number of weeks employed per quarter. These data were analyzed in two ways. The first was a direct comparison of the mean number of weeks employed with no adjustments being made except to total both full-time and part-time weeks worked per quarter. The mean values were within less than one week of each other for all three FATEs with a nonsignificant F statistic (see Table 4-7).

The second analysis attempted to adjust for individuals who did not work all five quarters and thus had a lower total weeks worked in the first analysis but were still employed. The second analysis totaled all weeks worked and determined an mean value for all quarters worked for each individual. This mean quarterly value was then multiplied by four to produce a value extrapolated to represent the average weeks worked for a standardized year. These values also were not significantly different among the FATEs. This would indicate that if unemployment and education are related in a meaningful way, that there was no significant difference between the three FATEs in terms of the total labor productivity per FATE when measured by number of weeks worked and no significant difference between the FATEs in the costs to society for unemployment compensation and other social programs designed to assist the unemployed.

CHAPTER 6
CONCLUSIONS AND RECOMMENDATIONS FOR FURTHER STUDY

The conclusions to be drawn from this study must be viewed in light of the limitations inherent within the dataset and the specific population from which these data were gathered. When using the framework of the benefits to be derived from increases in human capital which result from investments in education, the results strongly suggest that in the first eight years following graduation with an Associate in Arts degree, the graduates in FATE #1 compare very favorably with the graduates in FATE #3 in terms of the direct financial returns available to the graduates in both FATEs. Despite the fact that a baccalaureate degree, in general, accesses a different set of job opportunities than an individual with an Associate in Arts degree, in over half of the direct comparisons of income, there was no significant difference between all three FATEs. In career fields which place a high value on education, the individuals in FATE #3 have significantly higher incomes than individuals in FATE #1. In the public sector where job experience and seniority in the system have equal or greater value than education, the mean annual earnings of

individuals in FATE #1 were significantly higher than individuals in FATE #3. This difference in incomes coupled with the liberal educational aid available to graduates employed in the Public Administration division and the highly structured hiring and promotion policies, aid the graduates in FATE #1 to increase their individual productivity and also increase the direct financial benefits accrued within this division. The mere existance of a statutory salary incentive program for the police and fire employees, is only one indicator of the value placed in the Associate in Arts degree by employers in the public sector.

The negative internal rate of return in the comparison of FATE #3 with FATE #1 also suggests that overall the deferred earnings anticipated by individuals in FATE #3 have not yet offset the additional costs of two years of university preparation. The Direct Social Benefits provided by education also supports the observation that there was no significant difference in the on-the-job labor productivity as indicated by the comparison of the total number of weeks worked during a five quarter period for all three FATEs and no difference between the costs incurred by society in the support of a non-productive unemployed worker.

The financial option returns in terms of the availability of additional education or on-the-job training would suggest that it was actually advantageous to have less than a baccalaureate. This would be true because there were more programs at the associate degree level (both academic

and vocational) that are willingly supported by employers than there are for postbaccalaureate opportunities. On-the-job training programs were extremely limited among the vast majority of employers interviewed, however, educational assistance plans were usually quite liberal and accommodating to the employees' needs as long as the degree would directly benefit the employer in some way.

The opportunity options for all three FATEs would appear to be more dependent on external labor market forces than on differences in education. Even though the array of potential jobs available to baccalaureate graduates is quite different than those positions available to individuals in FATE #1, the number of graduates in each FATE for each SIC division other than the Retail Division, was not significantly different from the total number of graduates in FATE #1 and FATE #3, therefore the distribution of graduates was not significantly different than could be expected in a proportionate distribution of individuals by SIC division within the job market. This implies that the type of jobs available at the time of the job search would have a greater impact on the type of job secured than the academic credentials held at the time of initial hiring. The Retail division had a higher than expected number of FATE #1 graduates working in relatively low paying jobs. This would strongly suggest that job availability (especially for a second family income) would make the seasonal, temporary, or part-time retail positions

attractive to individuals in FATE #1 and could be used to augment total income in a significant way over the period of time covered by this research.

Finally, when using the Associate in Arts degree as a hedge against technological displacement of skills, it would appear that Associate in Arts degree graduates were perceived by employers as being imbued with a greater number of positive characteristics as a group than high school graduates. High school graduates were reported by the respondents to be the group of applicants which the Associate in Arts degree graduate would most likely be competing with for positions which do not require a baccalaureate degree. This added perceived value along with an expressed disappointment in the academic skills of high school job applicants, makes individuals in FATE #1 very attractive potential employees to many of the non-service and non-retail employers. This factor in combination with the greater potential for using the financial option benefits incorporated into employer educational assistance programs, opens a wide array of economic and employment possibilities to holders of just the Associate in Arts degree. These possibilities are certainly comparable to and in some cases even exceed the depth and breadth of options and direct benefits available to graduates in FATE #3.

Recommendations for Further Research

Up to this time there have only been a handful of studies which address the economic impact of community

college degree programs on graduates. Of the few studies which include the Associate in Arts degree as a component, several point to an internal rate of return of which is usually of intermediate value between that of a high school graduate and a baccalaureate graduate. Taubman and Wales (1975) conducted one of the first studies to determine that the group they identified as college dropouts (having 1-3 years of college) had an internal rate of return which exceeded that of college graduates. McMahon and Wagner (1982) pointed out that community and junior colleges with their technical programs offer relatively high returns to the graduate for the amount of money invested. The thrust of almost all of the limited previous work has been either to use census data in which the Associate in Arts degree graduates are combined with college dropouts into a single category (1-3 years of college) or they examine exclusively the value of the Associate in Science (technical) degrees and completely overlook the Associate in Arts graduates.

The primary purpose of this study was to see if the an Associate in Arts had a provided a distinct set of benefit to graduates who have not pursued further education. Johns, Morphet, and Alexander (1983) pointed out

> The more educated person in the job market receives preferential treatment from the employer. Whether this is justified is largely irrelevant if the marketplace responds in this manner. Employers appear to recognize that the educated worker has favorable external benefits on the other workers and on the firm in general. (p. 53)

The perceived value of an Associate in Arts degree expressed by most of the employers interviewed was definitely in line with Johns, Morphet, and Alexander (1983) and whether these perceptions are justified or not, they still influence the hiring practices and employee benefits offered by employers.

The most interesting and surprising results of this study are the areas in which more thorough research appears to be warranted. First, the reasons behind the negative rate of return when comparing FATE #3 and FATE #1 should be examined much more fully. Indeed, if an entire graduating class could be studied longitudinally, with rates of return calculated at different chronological distances from graduation, the rates of return should show trends which would define the point in time and in an individual's career where the deferred earnings gained by the baccalaureate degree recipient surpasses the earnings of individuals with less education. At this point the rate of return should demonstrate a positive value for the baccalaureate degree.

Secondly, the disaggregated incomes for Associate in Arts degree graduates in each major group should also be analyzed. The dramatic differences in incomes among Associate in Arts degree graduates, especially where FATE #1 is significantly different than FATE #3 in the favor of FATE #1, should be examined more thoroughly. There is an important relationship between education and income here which has not been investigated in most other studies. This relationship is probably industry specific and could be used

to better guide graduates at all levels of education in selecting the most lucrative and personally satisfying career field to enter.

Finally, the last suggestion for additional research surrounds the samples themselves. Through the interview process it became apparent that there were potentially more baccalaureate graduates among the individuals in FATE #1 than was determined simply by a comparison with the SUS database. Incongruities between the assignment of graduates to the three FATEs and the jobs employers reported the graduates holding were encountered often enough to suggest that direct contact with the graduate is essential to determine accurately the actual rate of transfer to private or out-of-state schools. It was assumed that individuals who attend a community college would be on limited budgets or be economically tied to a specific geographic area, therefore the relatively low cost and high convenience offered by state universities would limit the number of individuals in FATE #1 attending private colleges and universities. Accurately defining the rate of transfer is essential in determining the effectiveness of transfer programs. All previous state level studies have utilized a definition of transfer success that has almost exclusively focused on those graduates transferring to a state university. By assuming that the rate of transfer to non-public institutions is relatively low, researchers examining transfer programs could seriously underestimate the total

transfer success. If in fact the number of graduates transferring to out-of-state or private colleges and universities is larger than thought, i.e., at a rate of 15-20% above current estimates, this could have a major impact on all state level assessments of community college effectiveness and require that these studies revise their methodologies for assessing the rate of transfer to the university by Associate in Arts graduates and reevaluate prior assessments of rates of transfer.

APPENDIX A

LETTER OF INTRODUCTION SENT TO EMPLOYER

August 21, 1989

ABC Corporation
123 Lakeview Drive
Gator City, Fl 32611

Attn: Director of Personnel

Gentlemen:

As a part of an on-going study of Florida Community College graduates sponsored by the Institute of Higher education, an individual in your employ has been randomly selected from a sample of over 2000 Associate in Arts degree graduates. The purpose of this study is to evaluate the relative value of an Associate in Arts degree in the labor market.

As one component of the total study, it is necessary to interview a small subset of representatives from the firms employing each of these graduates.

The purpose of this letter is really two-fold: first, to introduce myself and acquaint you with the purpose of the study, and second, to request your office's assistance in contacting the appropriate individuals for interviews.

I will be telephoning your office sometime during the next three weeks and I hope it will be possible to speak with you or your representative at that time.

Thank you for your assistance,

R. Bruce Judd
Research Associate
Institute of Higher Education
University of Florida
(904) 392-0745
(813) 489-9429

APPENDIX B

APPLICANT SELECTION GUIDE

FORM 250-015-01
PERSONNEL
04/86

APPLICANT SELECTION GUIDE

PAYROLL UNIT & JOB CLASS	POSITION NUMBER & CLASS TITLE	ADVERTISING PERIOD TO
DATE POSITION FILLED	PERSON APPOINTED	REFERRAL SOURCE OF APPOINTEE
INTERVIEWERS		CERTIFICATE NO./EXPIRATION DATE

(1) MINIMUM TRAINING AND EXPERIENCE REQUIREMENTS

a. _____

b. _____

(2) PRINCIPAL WORK ASSIGNMENTS

a. _____

b. _____

(3) SPECIAL CONSIDERATIONS/QUALITIES

a. _____

b. _____

(4) NAME	BIRTH MONTH YEAR	RACE	SEX	HANDICAPPED	(5) QUALIFIED	NOT QUALIFIED	(6) Communication Skills K Factor 1.2 Option		Motivation & Interest in Position K Factor 1.0 Option		Knowledge & Skills of Occupational Subject K Factor 1.5 Option		Ability to Accomplish Assignments K Factor 1.3 Option		Education K Factor 1.3 Option		Planning & Organization Abilities K Factor 1.5 Option		K Factor 1.0 Option		K Factor 1.0 Option		(7) VERIFIED REFERENCE SCORE	(8) CAPACITY AND INTERCEPTIONS	(9) FINAL SCORE
							Rating	Sub Total	Rating	Sub Total	Rating	Sub Total	Rating	Sub Total	Rating	Sub Total	Rating	Sub Total	Rating	Sub Total	Rating	Sub Total			
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— SEE REVERSE SIDE FOR INSTRUCTIONS —

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BIOGRAPHICAL SKETCH

R. Bruce Judd was born in Louisville, Kentucky. Following high school he attended both the University of Colorado and the University of Louisville during his undergraduate years. He was graduated from the University of Louisville in 1968 with a AB degree in biology. Following graduation, Mr. Judd was employed in industrial chemical sales in Ohio until 1970 when he moved to Tampa, Florida, where he married his wife, Katherine, in May of 1970. The following year he entered the master's degree program in biology/jr. college education at the University of South Florida.

Following his graduation in 1974, he was an assistant professor of biology at St. Petersburg Junior College from 1974 to 1977, where he was also active as a consultant with the Pinellas County Artificial Reef Project. In 1977 he moved to Sumter, South Carolina, to accept a position as an assistant professor of biology at the Sumter Campus of the University of South Carolina. While at USC he pursued course work in geological oceanography and briefly worked with the Baruch Marine Institute in Columbia, South Carolina.

In 1980 he moved to his current position as a faculty member at Edison Community College, where he teaches human

anatomy and physiology, marine biology and oceanography. While at Edison Community College he was encouraged to pursue a doctorate in educational administration, and in 1986 he was granted a two-year sabbatical at half salary in order to enroll in the higher education administration program (now educational leadership) at the University of Florida.

While at the University of Florida he worked closely with the Institute of Higher Education and the Interinstitutional Research Council as a graduate research assistant. In the spring of 1988 he was the recipient of the L.V. Koos Award in support of his research on community college graduates. Mr. Judd looks forward to a major change in career paths, from the science classroom to Institutional Research within the community college, following the successful completion of the PhD. degree.

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

James L. Wattenbarger, Chair
Professor of Educational Leadership

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Carl A. Sandeen
Professor of Educational Leadership

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

James J. Algina
Professor of Foundations of Education

This dissertation was submitted to the Graduate Faculty of the College of Education and to the Graduate School and was accepted as partial fulfillment of the requirements for the degree of Doctor of Philosophy.

December, 1989

Dean, College of Education

Dean, Graduate School